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CAOUTCHOUC GUTTA-PERCHA

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NO PSYCHOLOGY IN THE AUTO. TRADE.

IT is reported that Mr. Henry Ford, on the occasion of his recent visit to Washington, mentioned so widely in the daily press, greatly encouraged and heartened the President by his assurance that business generally was taking on a very lively aspect.

From the viewpoint of Mr. Ford and others engaged in the manufacture of motor vehicles, there certainly is no depression, "psychological" or otherwise. The average citizen may be resorting to the "movies" in place of the legitimate drama and he may be practicing many other stern and rigid economies, but as yet he has shown little disposition to forego his motor car. The registration of motor vehicles in the thirty odd states where this registration is required had reached a figure by the end of June nearly two hundred thousand higher than that for the entire year of 1913. The manufacturers of autos. report excellent business everywhere, and the twenty-four companies engaged in this work in Detroit turned out over forty-one thousand cars in the month of May—and May is esteemed, normally, a dull month.

All this bears out the remark of the philosopher who said that humanity could do without the necessaries of life but it must have the luxuries.

As an interesting corollary of the motor situation, it might be added that the horse plods on his even gait, in no way disturbed. It has been continuously prophesied for several years that with this vast increase of motor vehicles the horse would disappear and that very soon he could be found only in natural history museums sufficiently endowed to command the rarer specimens. But as a matter of fact there are more horses now in the United States than ever before. The count at the beginning of this year showed nearly twenty-one million of them, or over one-fifth of a horse per capita; and that is a higher percentage than was the case forty and fifty years ago, before ever motor cars, motorcycles or bicycles were dreamed of.

The gist of the matter is that the present age is an age of motion. The one universal desideratum is something to get about with. Everything else can wait. And this is the explanation of the fact that, while business generally is depressed—psychologically or categorically—the sale of the auto. goes cheerfully and undiminishedly on.

A MINOR BUT VASTLY POPULAR RUBBER SORT.

AS an ambition to excel is a distinguishing national trait, it will probably give all true Americans keen gratification to know that they are the greatest gum chewers on earth. A New York daily recently devoted a half column or more to setting forth the marked increase of the chewing gum habit in the United States during the last few years. It asserted that the consumption of this delicacy is five times as great now as it was a decade ago. By way of statistical corroboration it stated that the present annual consumption amounts to twenty-five million packages, each containing one hundred small bundles of five sticks. Accepting these figures as authentic, a little mathematical exertion will show that the hundred million people of the United States did away with twelve and a half billion sticks of chewing gum last year.

There is much in American national life to make the judicious grieve, but even the most pessimistic would hardly concede that they—including the toothless infant and the doddering centenarian—consume an annual average of one hundred and twenty-five sticks of gum.

As a matter of fact, the gum chewing contingent is largely confined to those exuberant people whose years range from 8 to 20, who constitute about one-quarter

of the population. To be sure, there are many members of that class who are not addicted to this habit, but on the other hand, there are undoubtedly many who have passed the 20-year mark who still cling to this delicacy; so that it would probably be conservative to estimate the chewers of gum at one-fourth of the citizen body. But to take the position that twenty-five million people consumed twelve and a half billion pieces of gum last year, or at the rate of five hundred pieces per capita, is making a statement that will hardly appeal to the reasoning mind. It might not be impossible, but it is distinctly improbable.

The journal referred to probably secured its figures from some optimistic sales promoter—a class of statisticians whose calculations are always prone to run along the higher levels. It should not be difficult, however, to arrive at a figure that should be approximately correct.

The essential feature of all chewing gum is chicle, and as chicle belongs to the great rubber family—being derived from the latex of the *Achras sapota*, which has a rubber content of over 17 per cent.—it might not be uninteresting to pursue this subject a step further and to discover how much of a factor in American life the product of this particular rubber tree may be.

During the last calendar year chicle was imported into the United States to the amount of 13,758,592 pounds, of which 4,896,996 pounds was re-exported, leaving for domestic use 8,861,596 pounds, which was made up into chewing gum. Now the question is,—How much did it make? Not a difficult question to answer—at least approximately. One of the little five stick packages retailing for a nickel weighs just an ounce. When all the various decorative wrappings are removed, the residual gum is reduced to one-half ounce in weight; and 50 per cent. of this weight may be told off for sugar, peppermint and the other ingredients employed to appeal to the palate. That is, the amount of chicle in five sticks of gum is one-quarter ounce. From which it may be readily deduced that a pound of chicle will make three hundred and twenty of the customary sticks of commerce. It follows further that the importation of chicle last year would make something over two billion, six hundred million sticks of gum. Apportioning this among the twenty-five million people who constitute the gum consuming class, it gives them an individual allotment of one hundred and five sticks a year—which seems fairly moderate and reasonable.

An interesting feature of this industry lies in the fact that this consumption of chewing gum calls for a yearly expenditure on the part of those who engage in it of twenty-six million dollars—which is one-third of what Americans spend for rubber boots, arctics and overshoes to preserve the national health, and one-fifth of what they spend for tires to make it possible to use the million and a quarter motor cars of one kind and another.

Here is a great chance for the moralist to recite how many kinds of uplift that twenty-six million dollars could be made to give humanity if properly applied. But that is another story. This treatise simply views the matter in the light of a widespread and increasing use for rubber—to be sure, one of the minor rubbers, but still an exceedingly popular variety, carrying chronic joy, not to mention possible dyspepsia, to the hearts and stomachs of millions of youthful or once youthful Americans.

WHEN THE RUBBER TRADE GENUINELY MIXES.

THE midsummer outing of the Rubber Club of America has come to be an event. Its last celebration, held July 14, is set forth elsewhere in this issue with proper circumstance and several photographic illustrations. No other feature in the life of the club is so effective in fostering and forwarding general trade amity, personal acquaintance and wholesome good fellowship as these July gatherings of rubber men. The midwinter banquet is not to be esteemed lightly; that is a notable function. But social activities at a formal dinner are always more or less circumscribed, and beside, no man can be altogether true to himself when hidden behind a vast expanse of shirt front and a white choker.

But in the midsummer outing all this is changed. There are freedom and informality, and an all-day chance to get acquainted. When a man who hasn't played baseball for twenty years goes to the bat and actually hits the ball and starts for "first," he instantly reverts to type; all veneer is laid aside, and he becomes his natural self for the rest of the day.

And then again, what could possibly mellow a man more towards his hated business rival than to trim him handsomely at quoits? It becomes evident at once that this business rival is really not such a bad fellow.

The rubber club during the last year or two has taken upon itself some tasks of great moment, the accomplishment of which will undoubtedly be of substantial benefit to the trade; but if the club were to do nothing more than to maintain intact and undiminished its midsummer outing, it would never need any other excuse for being.

COLOMBIA OUGHT TO THROW IN HER RUBBER TRADE.

LAST December Colombia revised her tariff, marking some articles up and some down. The rubber duties for the most part were lowered, as will be seen from the instances mentioned below. In the items cited the duties have been changed from pesos per kilogram into their equivalent in cents per pound, as being rather more intelligible to the average American rubber man.

The general tendency of the new tariff seems to be towards uniformity, as is shown by the fact that while the duty on rubber floor cloth has been reduced 75 per cent. and that on rubber mats increased 700 per cent., both now stand at 16 cents per pound. The same tendency is seen in rubber cotton cloth, as the thin rubbered cloth has been increased 8 per cent., to 50 cents per pound, while the thick rubbered cloth has been reduced 10 per cent., to 41 cents per pound. Tires have been increased 15 per cent., to 9 cents per pound; toys decreased 57 per cent., to 27 cents per pound. Footwear stands practically where it did before, at 45 cents per pound. There has been a reduction of 97 per cent. in the duties on driving belts and of 80 per cent. in the duties on hose, both being now almost on the free list, belts paying only 5 mills per pound and hose 4½ mills per pound. Rubber soles and heels have been reduced 75 per cent., and like rubber mats pay 16 cents per pound. Rubber sponges have been reduced 25 per cent. and now pay 45 cents per pound, while rubber erasers are taxed at 68 cents per pound.

The reductions enumerated above are not yet in full effect, the new tariff carrying the provision that all increases should take effect at the rate of one-third each month for the ensuing three months, so that the increases took final effect last March, while the reductions did not begin to take effect until March and then went into operation at the rate of one-tenth per month, the full reduction not becoming operative until next January.

To be sure there are larger things in the world than the volume of rubber importations into Colombia. According to the latest statistics published—those of 1912—the rubber importations into Colombia amounted to one hundred and two thousand dollars for the year, of which the United States supplied about twenty-six thousand dollars. But perhaps with these lower duties the consumption of imported rubber goods will materially increase in that republic. If so, the United States ought certainly to do considerably better than this. After spending four hundred million dollars for a canal which will enable Colombia to sail directly from her front door to her side door, without making a circuit of twelve thousand miles around the continent, and after paying an additional twenty-five million dollars (if we do) for the privilege of conferring that great benefit on the Colombians, and after an apology framed with due humility for ever having dug the canal at all, it would seem as if Colombia might pass over to us the greater part of her rubber trade as a sort of *quid pro quo*.

"ONE OF THE FIVE LARGEST PRODUCERS."

THAT staid, sober and altogether reputable publication, the "New York Commercial," in a recent issue made the statement that a certain New England rubber manufacturing company—mentioning the company by name—"will in the fiscal year to October 31 next probably produce between 900,000 and 950,000 tons. This makes it one of the five largest producers in the country."

If the company's production of manufactured rubber goods reaches the volume mentioned in this item it certainly is entitled to be classed among the five largest producers. Taking rubber goods on an average—tires, belting, shoes and the other standard lines—it probably would be a conservative estimate to say that the crude rubber used in their manufacture would represent one-fourth of the weight of the finished goods. That is, in 900,000 tons of rubber manufactured goods there would be approximately 225,000 tons of crude rubber. But the world's output of crude rubber last year was only 113,000 tons. It is quite evident, therefore, that any manufacturing company which is consuming twice the entire crude rubber supply of the world in the manufacture of its goods may safely be assigned a fairly important place in the industry.

NORTH AMERICAN BANKS IN SOUTH AMERICA.

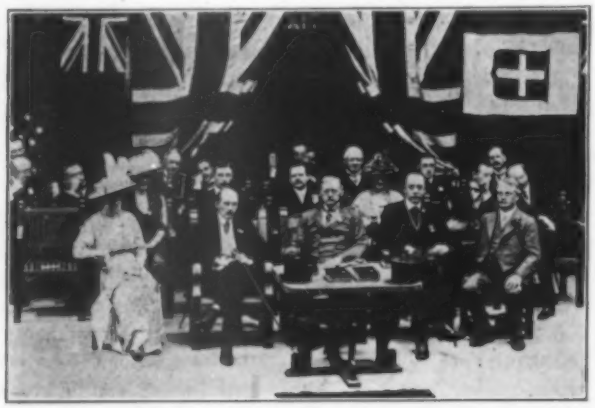
IN the June number of this publication the difficulties in the way of establishing direct banking relations between the United States and South American centers were described at some length. One North American bank, however, has decided to establish branches in Rio de Janeiro and Buenos Aires to determine if these difficulties cannot be overcome. Fortunately the bank that has essayed this task is one of the strongest financial institutions in the world and has the resources to command success. For the last four years it has seriously contemplated this undertaking, but its agents have unanimously advised delay. But with changing conditions and with the growing demand from the business men of the United States for direct banking facilities with South America, the directors of the National City Bank of New York believe the time has arrived to make the venture. It undoubtedly is an act of wise finance, and it assuredly is a fine instance of patriotism.

The Fourth International Rubber and Allied Industries Exhibition.

HELD AT ROYAL AGRICULTURAL HALL, LONDON, JUNE 24 TO JULY 9.

THE Fourth International Rubber and Allied Industries Exhibition was opened at the Royal Agricultural Hall, Islington, on June 24, by Prince Arthur of Connaught, and continued until July 9, which terminated what was beyond any question the best of the four rubber expositions, from both a constructive and instructive standpoint. In calling upon Prince Arthur to declare the exhibition open, Sir Henry Blake thanked His Royal Highness for the honor done in consenting to open the exhibition, stated its objects, and incidentally paid a well deserved tribute to the organizing manager, Mr. A. Staines Manders.

After concluding his introductory remarks indicating that the amount of capital invested in the rubber industry exceeds £250,000,000, that 54 governments were showing their various products at the exhibition and dealing with its international character, he introduced Prince Arthur, who expressed his appreciation of having been invited to participate in an occasion of such importance in the history of the rubber industry. He had gladly acceded to the request to open the exhibition, being convinced of the advantages of such meetings for the promotion of branches of manufacture to which those present were devoting their energies and their lives. Consequently, he was greatly pleased to welcome delegates from so many countries, engaged in amicable rivalry.



THE OPENING CEREMONY.

Paraphrasing the old saying that "every dog has his day," he expressed the opinion that rubber is having, and will continue to have, its day. The latter half of the nineteenth century was essentially the gold mining era, but he thought that rubber, found in trees in Africa, Asia and South America, and one variety of which has been introduced with such marked success into Ceylon, the Malay States, the Straits Settlements, etc., would in the future prove to be as profitable as the golden mineral. While denying any personal interest in rubber shares, he felt that a boom in some department of industry would be very welcome; so why not another in rubber?

After tracing the history of plantation rubber from its well-known sources to the record exports of 1913, His Royal Highness alluded to the fall in prices as having been caused by the enormous production being in excess of immediate requirements. Hence the reason of this exhibition, to show the variety of uses to which rubber could be applied, thus offering a vast, untrodden field for future commercial enterprise.

THE PRESS LUNCHEON.

On June 23, the day preceding the formal opening of the exhibition, the initial view, with luncheon, was afforded to the press, delegates and exhibitors. Succeeding the discussion of a most appetizing menu, the chairman—Sir Henry Blake—proposed the customary toasts and made his usual happy introductions. The speaker succeeding Sir Henry was Mr. John McEwan, of the Rubber Growers' Association, who dealt with the various uses of rubber from the cradle to the grave, among other things suggesting the highly useful character of an asbestos-lined winding sheet, and very humorously paraphrasing the "Seven Ages of Man," so as to make that famous passage fit the varied utilities of rubber.

He spoke of the work accomplished by the Rubber Growers' Association with reference to the general availability of plantation rubber.

Among the other speakers were Mr. FitzGibbon, Dr. Ferrao, and Mr. Theodore E. Smith.

Incidentally, each member of the press was presented with a package containing the following substantial and useful souvenirs: Hot water bottle (best British make) and tobacco pouch, both made of plantation rubber by the Leyland & Birmingham Rubber Co., Ltd.; two beautiful wallets, given by the Continental Caoutchouc & Gutta-percha Co.; two golf balls, given by the Dunlop Rubber Co., Ltd.; a box of high-grade combs, from the North British Rubber Co., Ltd., and an eraser in a hexagon box from the Standard Asphalt & Rubber Co.

MANY HIGHLY ENJOYABLE RECEPTIONS.

This 1914 exposition was prolific of social events, which, by the way, have always been among the very pleasant features of the rubber shows which have gone before.

Succeeding the opening ceremony on June 24, Sir Henry Blake gave a reception and tea, which was largely attended and a very happy affair. Sir Henry was assisted in receiving by Lady Blake. During the afternoon an exhibition tennis match between Messrs. Cowdray and Hierons, both professionals, was played on the rubber court which was the special feature of the exhibit of the Leyland & Birmingham Rubber Co.

Probably no pleasanter reception than that given by the State of Pará and Pará Commercial Association, which occurred on Thursday, June 25, was given during the Exhibition. There was a delightful tea, and "tea," by the way, is a comprehensive term at a London rubber exhibition. There were no speeches and general joy prevailed. This function was attended by 150 guests, among whom were many persons of distinction.

The event of Friday, the 26th, was the visit of the Lord Mayor and Sheriffs, who constituted a glittering and highly edifying body. These distinguished gentlemen carefully inspected the various features of the exhibition and expressed themselves as being greatly pleased and much interested in what they saw.

On the afternoon of the 26th (which, by the way, was British Malaya Day) a reception was given by the British Malaya Committee, which was a largely attended and most successful event. Among those present were Sir John Anderson, G. C. M. G., late governor of the Straits Settlements; Sir William Taylor, K. C. M. G.; Sir Edward Ward, Sir Edward and Lady Birch, and a number of other well known people.

On June 27 the exhibition was honored by the official visit of the Belgian Minister to England and the Belgian Minister of the Colonies. In the afternoon the Belgian reception, always a noted event of rubber exhibitions, was held. The feature of this re-

ception was a lecture on the Belgian Congo, delivered by M. Ed. Leplae, general director of the agricultural department, Colonial office, Brussels. M. Leplae, whose remarks were illustrated by moving pictures, spoke of the climate and product of the Congo, and said that rubber planting would doubtless always prove a profitable investment.

EXHIBITORS AND DELEGATES VISIT BRIGHTON.

A most charming innovation was the visit on Sunday, June 28, of exhibitors and delegates to Brighton. The party assembled at Victoria Station and took a special Pullman train at 10:25, which arrived at its destination an hour later. On arrival at Brighton the rubber tourists proceeded to the water front (which indicated that they were waterproof) and there disported themselves in the buoyant manner known only to genuine rubber men.

INTERNATIONAL RUBBER BANQUET, PRINCES' RESTAURANT, LONDON, JULY 7, 1914. HELD IN CONNECTION WITH THE FOURTH INTERNATIONAL AND ALLIED INDUSTRIES EXHIBITION.

A delightful luncheon at the Hotel Metropole concluded the festivities of the early part of the day, after which the different members of the party spent the afternoon according to their several ideas, many of them taking the motor ride through Brighton and adjacent territory, which, by the way, constituted part of the program accessible to all who might wish to avail themselves of it. The dinner, which occurred at 7 o'clock at the Metropole, and at which the Mayor of Brighton was the guest of the evening, was a very pleasant function and His Worship, most felicitously introduced by Sir Henry Blake, spoke in a facetious and interesting vein. He said in effect that while Brighton did not afford any enterprise that might come under the generally accepted conception of industry, yet it was the province of that most delightful resort to restore to their normal condition minds which had been surfeited and bodies which had been jaded with too much industry, and that he felt in doing this work Brighton was effecting a most worthy and beneficial purpose.

The Mayor's remarks, received with great applause, were followed by speeches on the part of a number of others prominent in the gathering and oratory prevailed until train time, when a highly complacent rubber party entrained for London, thus concluding a most joyous occasion.

The visit of Princess Marie Louise to the exhibition on Monday, June 29, was an occasion of general interest. Her Royal Highness was intensely interested in the general display, and so expressed herself before leaving.

Ceylon, which has always been a prominent factor in the various rubber exhibitions, and which has always offered one of the most attractive exhibits at each of the shows, gave a delightful "at home," which was largely attended and proved to be one of the smartest functions at the exhibition. The guests were received by Mr. R. N. Lyne, the Commissioner of Ceylon, who also represented the Chamber of Commerce and the Planters' Association. Many prominent Londoners were among the guests.

MR. MANDERS GETS A GOLD MEDAL.

One of the happiest events of the 1914 exhibition was the banquet and presentation to Mr. A. Staines Manders of a gold medal, suitably inscribed, which was the gift of the French section. The dinner was held at the Café Royal and many laudatory things were said in reference to the guest of the evening "to whose genius and indefatigable effort was due the magnificent assembling of rubber and allied products from all parts of the world, and whose unvarying courtesy and fertility in resource so promoted the convenience and happiness of exhibitors."

THE RUBBER CONGRESS AND THE PAPERS READ.

One of the most important events of the exposition was the opening of the Fourth International Congress by Sir Henry Blake, on the morning of the 30th, and these meetings were

continued daily until Tuesday, July 7. Forty-one papers on a wide variety of subjects pertaining to the rubber industry and prepared by experts from every rubber country in the world, including manufacturing as well as rubber producing countries, were presented at this conference. It was hardly possible within the time limits to have all these papers read and discussed, but the following twenty-seven were read and considered during the sessions:

SECTION I.

DESCRIPTIVE, HISTORICAL AND GENERAL.

"Kelantan as a Rubber Producer."—By Mr. T. Clifton Hutchings.

SECTION II.

CULTIVATION AND BOTANICAL.

"Rubber in Cochin-China."—By M. Cremazy, of Indo-China.

"The Best and Most Economical Methods of Tapping."—By Mr. W. F. de B. Maclaren.

"The Physiology of Latex Formation in *Hevea*."—By Mr. R. H. Lock, Sc.D.

"A Comparison Between Wild and Plantation Grown Rubber."—By Mr. A. Irving.

"Manuring of Rubber."—By Mr. H. Hamel Smith.

"The Cultivation of the Rubber Vine in Central Africa."—By Dr. E. de Wildeman, Jardin Botanique de l'Etat, Brussels.

"The Systematic Study of Rubber Production."—By Mr. R. N. Lyne, F.L.S., F.R.G.S., Director of Agriculture, Peradeniya, Ceylon.

SECTION III.

COMMERCIAL, STATISTICAL AND FINANCIAL.

"Some Aspects of Plantation Rubber."—By Mr. E. L. Killick.

SECTION IV.

RUBBER PREPARATION.

"The Coagulation of Rubber Latex."—By Mr. N. W. Barritt, B.A., International Institute of Agriculture, Rome.

"The Chemical Coagulation of Rubber Latex."—By Mr. Frederick Kaye, A.R.C.Sc.

"The Depolymerization of Rubber (Chemical Study of Raw Rubber)."—By Mr. A. van Rossem, Delft.

"The Vulcanization of Rubber by Ultra-Violet Rays."—By. M. G. Bernstein, in conjunction with M. Helbronner (but separate paper).

"Contribution to the Study of Rubber Solutions Vulcanized by Ultra-Violet Rays."—By M. Helbronner, in conjunction with M. G. Bernstein (but separate paper).

"The Kinetics of Vulcanization."—Mr. Herbert Skellon.

SECTION V.

RUBBER PROPERTIES AND TESTING.

"Variability."—By Dr. Philip Schidrowitz.

"The Protëids in Rubber and in Rubber Latex."—By Dr. Fritz Frank.

"The Advantages and Defects of Plantation Rubber."—By Mr. W. A. Williams, General Works Superintendent, North British Rubber Co.

"American Methods of Testing Mechanical Rubber Goods."—By Mr. D. E. Douty, United States Conditioning & Testing Co.

"Some Experiments on the Direct Determination of Mineral Matter in Rubber Mixings."—By Messrs. B. D. Porritt, B.Sc., F.I.C., Chief Chemist, and R. Wheatley, B.Sc., A.I.C., Research Chemist, North British Rubber Co., Ltd.

"Determination of Bitumen in Rubber Mixings."—By Mr. B. D. Porritt and Mr. E. Anderson, Assistant Chemist, North British Rubber Co., Ltd.

"The Influence of Temperature on the Physical Properties of Rubber."—By Mr. P. L. Wormley, United States Bureau of Standards, Washington.

SECTION VI.

LABOR AND ORGANIZATION.

"Bonus Schemes for Managers and Assistants on Plantation Rubber Estates."—By Mr. P. J. Burgess.

SECTION VII.

RUBBER MANUFACTURE.

"Effects of Acids and Alkali in Rubbers, More Especially in Relation to Reclaimed Rubbers."—By Mr. W. G. Martin, Experimental Dept., North British Rubber Co., Ltd.

"On Rubbered Balloon Fabrics."—By Mr. Guy Barr, B.A., B.Sc., National Physical Laboratory, Teddington.

"Synthetic Rubber; Researches into the Commercial Preparation of Isoprene."—By M. Gaston Chardet.

"Plastides Derived from Oil Oxides."—By M. Gaston Chardet.

OTHER SOCIAL FEATURES.

French Day (Tuesday, June 30) was the occasion of the official Government reception and the visit of M. Paul Cambon, French Ambassador to England, to the exhibition. His Excellency was received by a number of commissioners and delegates, including Prof. Perrot and Dr. Gatin, secretary of the French section. M. Cambon congratulated the commissioners in charge of the French section on their exceedingly effective display.

Perhaps the most brilliant of the receptions was that given by the Rubber Growers' Association on the evening of June 30, to which the entire floor and balcony of the hall were devoted. The guests were received at the entrance to the main hall and a great majority of them after a general inspection of the attractions offered, repaired to the tennis court and listened to an attractive program of English folk songs; after which they adjourned to the balcony, where a sumptuous collation awaited them, and were further entertained during the evening by the Royal Artillery Band.

Another very successful event was the dinner given by the West India Committee on July 1, at the Royal Agricultural Hall, at which Sir Ernest Shackleton was the guest of honor. After the loyal toasts had been duly drunk the chairman proposed the health of Sir Ernest Shackelton and success to his expedition.

The reception by the State of São Paulo including a moving picture exploitation showing a number of scenes reflecting agricultural conditions in this section, was very much enjoyed. To individualize any particular reception in São Paulo section is rather difficult, as it was the scene of a continuous succession of receptions, inasmuch as it was persistently active in the serving of a delicious brand of coffee peculiar to the São Paulo district.

A reception of the Sudan government commissioners was held on Thursday, July 2, and an illustrated address on the Sudan was given by Mr. William Herbert Garrison, after which a tea was served.

THE BIG BANQUET.

The Fourth International Rubber Banquet was held on the evening of Tuesday, July 7, at Princes' Hall restaurant, Piccadilly, W., and was the concluding event of the social features incidental to the exhibition. After the customary loyal toasts Sir Henry Blake, the chairman, gave an exhaustive resume of the purpose and scope of the exhibition, incidentally paying a tribute to the effective work of the delegates to whose energy and capacity was largely due the opening of the exhibition in every way complete at the appointed hour. The responses to these remarks were made by Prof. Perrot, M. Leplae, and Mr. O. W. Barrett. In proposing the toast of the International Rubber Exhibition, Mr. Arthur Lampard alluded to the fact that the exhibition was responsible for the cementing of international friendships. One of the most effective speeches was made by Mr. Alex. Johnson on behalf of manufactured rubber, and his remarks were exceedingly well based and received with great applause. Mr. F. Pegler responded also for manufactured rubber and was well received. Among the other prominent speakers were Mr. Norman W. Grieve, who proposed the toast "Success to the Rubber Industry," to which responses were made by Mr. J. A. Mendes, of Pará, and Mr. Cyril Baxendale, vice-

chairman Fourth International Rubber Congress. The toast—"The Press"—proposed by Mr. John McEwan, chairman of the Rubber Growers' Association, and that of—"The Chairman"—by Mr. R. N. Lyne, director of agriculture, Ceylon, concluded the banquet.

AWARD OF PRIZES.

As has been mentioned several times in the columns of THE INDIA RUBBER WORLD, a large number of prizes was to be awarded in various competitions at the London exhibition. Including all the prizes—vases, cups, medals (gold, silver and bronze), cash prizes and certificates—there were forty-two awards. Below is given in tabulated form the award of first prizes in the different competitions in the various groups:

COMPETITION I—GOLD MEDAL.

Class I.—Crêpe: Balgownie Rubber Estates, Ltd., Kajang, Selangor, F. M. S., and Kintyre Tea Estates Co., Ltd., Ceylon.

Class II.—Smoked Sheet: Highlands & Lowlands Pará Rubber Co., Ltd., Port Swettenham, F. M. S.

Class III.—Assortment of No. 1 Rubber in Scrap Grades: Highlands & Lowlands Pará Rubber Co., Ltd., Port Swettenham, F. M. S.

COMPETITION II—GOLD MEDAL.

For the best exhibit connected with plantation rubber grown in the Middle East. Ceylon, and British Malaya.

COMPETITION III—GOLD MEDAL.

No award.

COMPETITION IV—GOLD MEDAL.

For the three best exhibits of rubber flooring in tile or sheet form; open to manufacturers of any country. North British Rubber Co., Ltd.

COMPETITION V—GOLD MEDAL.

For the exhibit composed of greatest variety of articles made from rubber for commercial purposes; open to manufacturers of any country. Leyland & Birmingham Rubber Co., Ltd.

COMPETITION VI—£50 AND A GOLD MEDAL.

Such new use for plantation rubber as may be adjudged the most valuable; with special consideration of the weight of rubber likely to be consumed. Morland M. Dessau.

COMPETITION VI-A—GOLD MEDAL.

Class 1.—For the most efficient hand-sprayer, ordinary type. Four Oaks Spraying Machine Co., Sutton Coldfield, near Birmingham.

Class 2.—For the most efficient hand-sprayer, knapsack type. W. Weeks & Sons, Ltd., Maidstone, Kent.

COMPETITION VII.

For the most efficient power-sprayer. W. Weeks & Sons, Ltd., Maidstone, Kent.

(Competitions I. to VII. were organized by the Rubber Growers' Association.)

GUMMI-ZEITUNG COMPETITION—SILVER VASE.

For the best design for laying out a factory for the manufacture of rubber goods. Georg Gelbert, Foreman, Stein Strasse 3, Berlin, O. (Prakticus.)

GUMMI-WELT COMPETITION—GOLD MEDAL.

For the best rubber manufacturing machine of German manufacture. Harburger Eisen und Bronzewerke, Harburg a/ Elbe, Germany.

INDIA RUBBER JOURNAL COMPETITION—£25 CASH.

Ideal Rubber Estate Competition. Leonard Smith, Kapar, Selangor, F. M. S.

Rubber Estate Photographs. H. F. Macmillan, Department of Agriculture, Peradeniya, Ceylon.

PRINCIPAL EXHIBITS.

CEYLON.

As in all the preceding exhibitions, Ceylon made a creditable and very instructive showing, the character of which is reflected in the winning of the gold medal of the exhibition—an honor, by the way, which was also accorded to the Malay States. The handsome pavilion and the very artistic display of various types of plantation rubbers all went to make up a most effective picture It is only necessary to mention the names of the working committee in London—Sir Edward Rosling, J. L. Loudoun-Shand, F. Crosbie Roles, C. O. Macadam, and W. M. Leake—to indicate the character of this exhibit.

BELGIUM.

Numberless pages might be devoted to this exhibit without approach to justice in the description. It is doubtful if anything more beautiful, more comprehensive in its character or more informing generally than this Belgian exhibit has ever been seen

MAIN HALL ENTRANCE TO BELGIAN STAND.

at a commercial show. Everything dealing with the production and preparation of rubber in the Belgian Congo was exploited in a manner at once simple and effective. Perhaps some idea of its size may be conveyed to those who have visited Agricultural Hall by the statement that this Belgian exhibit filled the entire entrance as well as King George's Hall; and possibly the picture here shown may afford some slight idea of its character. The gentleman directly in charge of this exhibit was Captain Commandant Leon Osterrieth, commissioner-delegate to the Fourth International Rubber Exhibition.

FRANCE.

The French exhibit, in charge of Dr. C. L. Gatin, like that of Belgium and a number of others, was a magnificent display, showing the wonderful possibilities of France and her colonies in connection with rubber and allied products. In the case of France, as in that of Belgium and various other mammoth governmental displays, the general classification "French Exhibit" included numberless smaller exhibits which reflected the greatest possible credit on both the nation and its representative in charge of the exhibit.

STATE OF AMAZONAS.

The prominent feature of this fine display was its remarkable showing of "Fine Hard," in large biscuits, which excited the admiration both of members of the industry and of the casual visitor knowing little or nothing about rubber. This exhibit occupied a large space and received a great deal of attention.

BRITISH GUIANA.

The nature and extent of the specimens of native product shown by British Guiana should do much to promote interest in the industries of that colony. The exhibit included, besides rubber and balata, which constitutes an important industry in the colony, a wide range of other indigenous products, all effectively displayed.

THE RUBBER GROWERS' ASSOCIATION.

This organization occupied a large portion of one of the galleries and made a most comprehensive and attractive display

SECTION OF RUBBER GROWERS' ASSOCIATION EXHIBIT.

of crude rubbers. There were a number of sub-exhibits indicating new uses for rubber, among them the Dessau roadway.

THE NORTH BRITISH RUBBER CO.

The North British Rubber Co., Ltd., of Castle Mills, Edinburgh, had perhaps the most effective and elaborate display among the commercial exhibits. The *pièce de résistance* was the famous rubber room, the entire contents of which, including the office table, were made of rubber; and the general effect was altogether fine. On entrance the visitor was asked to write his name in the rubber-covered guest book, with a rubber pen, the ink being supplied from a rubber inkwell, so that it was quite natural one should feel himself in a highly resilient atmosphere.

The tiling exhibit, in King George's Hall, was another artistic and industrial triumph for this very enterprising company. One phase of this particular exhibit testifying to the quality of North British rubber product was a stair tread which had been sub-

THE FAMOUS RUBBER ROOM.

jected to 24 years' wear without showing any appreciable damage. There was also a gallery exhibit of a rubber roadway manufactured and laid by this company.

FOUR OAKS SPRAYING MACHINE CO.

This company manufactures spraying machines and spraying apparatus of every description, its works being located at Sutton Coldfield, Birmingham. Upon this stand were shown a variety of types of spraying machines especially adapted to rubber plantation work and to be found today upon all the principal plantations. One of the prominent types is the "Four Oaks Gold Medal Copper Knapsack Sprayer No. 101," which has been particularly designed for use in tropical countries. It is made without rubber valves and with a powerful brass pump, with brass ball valve, which, being outside the container, is always easily accessible. This particular type is very popular with planters everywhere, but it is only one of many made by the company. The demonstration given in Agricultural Hall proved the effective work done by this type of sprayer to the satisfaction of all who witnessed it.

NORTH WESTERN RUBBER CO.

This stand, representing the interests of one of the most important concerns of its kind, was characteristically modest in its display, though an effective line of samples and charming hospitality greeted the visitor. The stand was in charge of the general manager, Mr. Ernest E. Buckleton, well known to the rubber world, and of Dr. Torrey, the chairman, by the way, of the conferences, and a recognised authority on all matters pertaining to the production of reclaimed rubber.

THE LEYLAND & BIRMINGHAM EXHIBIT.

The Leyland & Birmingham Rubber Co., Ltd., with works in Leyland and Glasgow and a London warehouse in Aldgate, E. C., made an exceedingly fine showing of mechanicals, tires and drug sundries and an especially fine exhibit of tiling, in the manufac-

THE RUBBER TENNIS COURT.

ture of which they are expert. The new rubber golf tee mat was viewed with unusual interest, particularly by the English contingent, who form a community of golfers.

The rubber tennis court, one of the greatest novelties of modern rubber production, shared honors with the rubber room. This court was the subject of much speculation on the part of players, who were inclined to assume that it would be unusually fast, but experience proved that if anything it afforded rather a slower game than the ordinary lawn game. The general effect was very artistic, the rubber flooring surrounded by "bleachers" being most pleasing to the eye.

WOOD-MILNE, LTD.

This stand was one of the busiest in the show, because of the general interest in "Pavea," offered as synthetic rubber. The samples were examined by large numbers of people and generally conceded to be excellent. The company also showed a general line of tires and motor goods.

THE CONTINENTAL CAOUTCHOUC & GUTTA-PERCHA CO.

The home of this great company is Hanover, Germany. Its exhibit reflected the important character of the house. It included Continental lawn tennis balls and Continental football bladders, in Rugby and Association shapes, as well as the "Contirex" bladders made with patent air valves, all of which attracted much attention. A substantial type of cotton-braided hose, jar rings, solid and insertion sheeting, drug sundries, waterproofs,

packings and aeroplane and balloon fabrics were all shown. The company could not display its famous line of tires because of agreement with the Motor Association.

HARBURG AND VIENNA INDIA RUBBER WORKS.

One of the most complete and interesting displays of rubber merchandise was made by this company, whose exhibit—the subject of a great many favorable comments—included rubber footwear adapted for various purposes, automobile accessories, various types of tires, technical articles, waterproof fabrics for clothing and other purposes, as well as fabrics for balloons, aeroplanes, etc. The stand was artistically arranged and the color scheme afforded by the varied product and its tasteful arrangement made a most pleasing exhibit.

THE UNITED STATES RUBBER RECLAIMING CO.

This company, with factories in Buffalo, New York, and executive offices in New York City, had an elaborate reproduction of its exhibit at the 1912 show in New York. This stand was a center of general interest, its visitors representing a large buying element from all over the world. The testing plant, in charge of Louis D. Plum, the chief chemist of the company, demonstrated, among other things, that this product was one adapted for insulating purposes, sustaining successfully a test

UNITED STATES RUBBER RECLAIMING CO.'S BOOTH.

of 45,000 volts. The tensile strength of the various types of reclaimed rubber made by the company was manifested by a motor-driven testing machine made by the Hartford Special Machine Co. for the purpose, all the different grades subjected to this strenuous trial having "made good" without exception. The stand was in charge of Mr. Clarence H. Loewenthal, secretary of the company, and Mr. Louis D. Plum, its chief chemist.

THE PIERCE WRAPPING MACHINES.

The Pierce Wrapping Machine Co., of Chicago, Illinois, exhibited its various types of tire-wrapping machines, the capabilities of which were demonstrated by Mr. Pierce, himself, who was in charge of the stand. This company also showed its wire-wrapping machine. The *modus operandi* of these Pierce devices is generally known to rubber manufacturers in the United States. This very economical and durable method of wrapping is effected by doubling the edge of the paper as it is applied and the wrapping of an adhesive band around the tire in cross relation to the spiral wrapping. It is easily applied, and removed with equal facility. These machines are thoroughly protected by patents.

STANDARD EMAREX CO.

This company had an exhibit which reflected the many excellences of "Emarex." Needless to say this most effective showing was the work of that well known dispenser of "Emarex," Mr. George Watkinson, whose indefatigable and highly successful efforts in the popularizing and sales promotion of this brand of mineral rubber is really a notable phase of rubber trade history. Of course the dominating factor of the display was the famous "drums" which led this celebrated product into foreign

STANDARD EMAREX CO.'S BOOTH.

but now friendly lands and which, incidentally, completely routed the enemy. Messrs. Lange, Beahan & Co., the present European agents for "Emarex," assisted Mr. Watkinson in handling the stand and interviewing its numberless visitors. This was the only mineral rubber concern which made an exhibit.

John Lang, Ltd., whose stand was always surrounded by interested visitors, exhibited the product of the Prowodnik company, of Riga, which makes a popular reclaimed rubber. Mr. Lang is the sole sales agent of the Prowodnik company and he has extensive connections all over the world.

The Dunlop Rubber Co., Ltd., showed various types of Dunlop solid tires, golf balls and shoe findings. These Dunlop golf

PIERCE WRAPPING MACHINE CO.'S BOOTH.

balls are especially dear to the heart of the British golfer and are rapidly finding their way into the affections of the general golfing world.

The Hood Rubber Co., Ltd., which is the English branch of the Hood Rubber Co., of Boston, Massachusetts, exhibited a complete line of their famous footwear. Their new brand of "Bullseye" rubber boots, made for mill and factory purposes, attracted a great deal of attention.

The well-known Italian house of Pirelli, Ltd., displayed most effectively various lines under the general classification of tires, technical and mechanical goods, athletic goods, drug sundries and traveling requisites.

Louis Schopper made a most interesting showing of his rubber

testing devices. He probably had as many visitors as the great majority of the stands, and it was quite manifest that most of them were interested in his product. It was generally conceded that Mr. Schopper was one of the busiest men at the show.

Lehmann & Voss, of Hamburg, Germany, showed an extensive and interesting line of compounding ingredients, well known and extensively used both on this side of the water and in the United States.

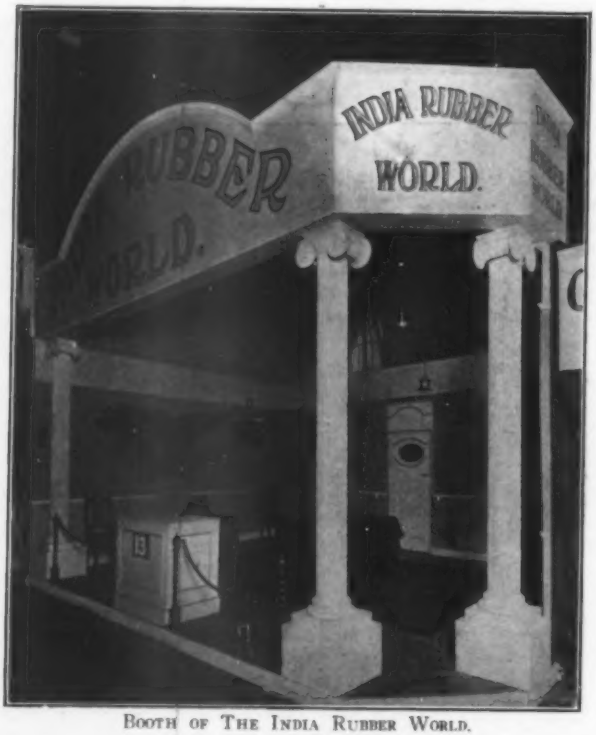
The Pulsometer Engineering Co., Ltd., exhibited its "Normair" rubber drying plant, the special feature of which is drying the rubber at low temperature—claimed to be a safe and economical method.

What is known as the hard cure process, an invention of Mr. H. A. Wickham, was the subject of much attention and interest at the show. Mr. Wickham's process deals with the treatment of latex by the application of antiseptic smoke and heat. It is claimed to be a most convenient method and to economize both time and cost, exerting at the same time a standardizing effect on the grades. Sample blocks of rubber treated by this process were shown and favorably commented upon.

There were a number of interesting processes of curing rubber, including those of Dr. Pinto, and the Byrne Process.

Dr. Pinto's exhibit, located in the gallery, was among those that attracted unusual attention. The Pinto process, it is claimed, is a rapid coagulant, free from acids. A number of articles were shown that had been produced from rubber made by this process.

David Moseley & Sons, with works at Ardwick, Manchester, and offices in London, had an effective display of tires made from plantation rubber.



BOOTH OF THE INDIA RUBBER WORLD.

RUBBER EXHIBITION NOTES.

NORTH BRITISH COMPANY GETS TROPHY FOR BEST EXHIBIT.

THE North British Rubber Co., Ltd., of Edinburgh, was awarded the President's Trophy at the Fourth International Exhibition at London for the best exhibit of any kind. It also was awarded the gold medal for its display of tiling. The most notable exhibit made by this company was a rubber room, in which the whole setting of the room, and practically every article of furniture in it, were made of rubber.

There was a particularly fine series of pictures dealing with the factory life of the North British company, and the gathering of rubber, etc., in British Malaya. There were also films of the São Paulo Coffee Plantation, in addition to some very excellent views of the Congo.

The actual number of British and Foreign governments which exhibited at the show was 54.

Among the well known American visitors to the exhibition were: Mr. George B. Hodgman, president of the Hodgman Rubber Co., New York; Mr. Frederic Hood, president of the Hood Rubber Co., Boston; Mr. J. H. McLean, of the Pequanoc Rubber Co., Butler, New Jersey; Mr. James T. Johnstone, of Johnstone & Whitworth, crude rubber importers, New York, and Mr. C. E. Douty, of the United States Conditioning Co., New York.

REPRESENTATION BY THE STATE OF PARA.

The following cable was sent from London to the "Folha do Norte," Pará, on June 26:

"The exhibit of Pará products has met with evident success at the Exhibition of Rubber and Tropical Products at the Royal Agricultural Hall. The managing committee, keeping in view the efforts made by the government and commerce of Pará, is surrounding the Pará delegates with every distinction, giving Pará precedence at the festivities."

These delegates were: Señhores Emilio Martins, secretary of commerce; Amando Mendes, secretary of the Pará Commercial Association, and Dr. Souza Castro. The municipality of Belem was represented by Dr. Bento Miranda and Colonel Raymundo Brazil, while the delegates from Itaituba were Dr. Theodore Braga and Dr. Jayme Abreu.

On the second day, considered as the "Pará Day," there took place at the stand a sympathetic meeting, presided over by the Brazilian minister and Dr. José Carlos Rodrigues, Brazilian Consul General in London; all acting specially on behalf of Dr. Eneas Martins, governor of the State of Pará. Among those present were Sir Henry Blake, president general of the exhibition, and a large committee, the staff of the Brazilian Consulate, and a large number of Brazilians and persons of other nationalities.

The display of Pará products, though modest in comparison with those of São Paulo and other sections, aroused interest for the variety of the exhibits and their artistic arrangement.

A PLEASANT COMPLIMENT FOR THE SECRETARY, MISS FULTON.

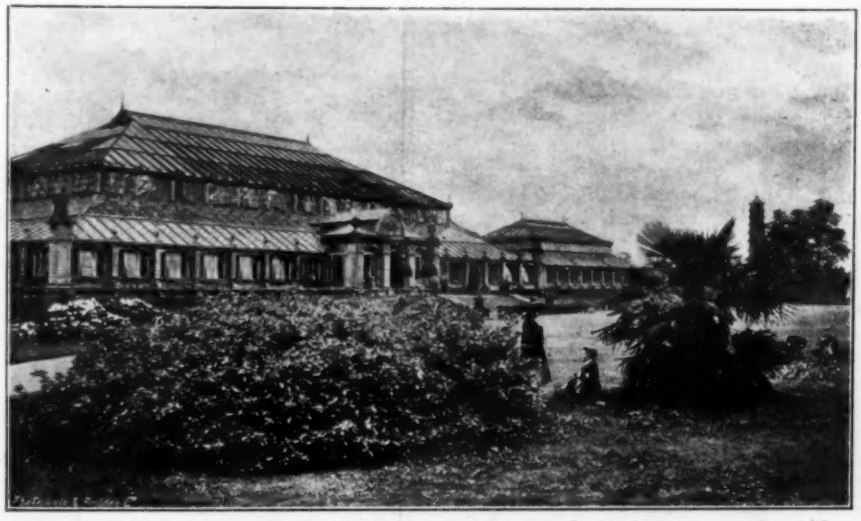
One of the closing incidents of the rubber show, and an exceedingly pleasant and popular one, was the presentation to Miss D. Fulton, the very efficient and charming secretary of the exhibition, of a diamond ring, by the exhibitors and delegates, in order that they might in some small degree testify their appreciation of the uniformly courteous and helpful manner shown toward all by this lady. Sir Henry Blake, the president of the exhibition, occupied the chair, and on behalf of the committee representing governments and exhibitors, Dr. Argollo Ferrao made the presentation speech, while Dr. Carlos Pinto made the actual presentation by placing the ring on the lady's finger. The recipient made a brief and feeling response.

TWO TIRES THAT RAN OVER 9,000 MILES.

The Overman Tire Co., of New York City, recently received a letter from a man who had used two of their tires on the rear wheels of his 50 h. p. Simplex. He wrote them that one of these tires had served him for 9,100 miles and the other for 9,200 miles before he found it necessary to replace them. As this was a phenomenal record for any sort of tires, the Overman company secured the tires and photographed them and has used them effectively in its newspaper display advertising.

Britain's Tropical Gardens and What They Have Done.

BOTANY, in its original meaning, was a discourse on fodder and the first botanical gardens were, no doubt, planted with strictly utilitarian aims. The first were for utility, the second for beauty and then came those intended to serve the cause of knowledge. Finally these objects were combined in the gardens of the experiment stations of the modern state. The "herbal gardens" of the middle ages, which were the immediate precursors of the botanical gardens of the present day, were planted with medicinal herbs, but in many instances the grower probably was moved more by a desire to know and possess many curious plants. Scholars who had a special liking for the study of plants went from one of these gardens to another and wrote down in horrible Dog-Latin descriptions of what they found. These manuscripts were collected, underwent redactions, and lists of plants found in "herbal gardens" were made. From these lists ambitious owners planned new gardens, new lists were made and thus the sciences of gardening and of botany developed as the years went by.



THE WINTER GARDEN AT KEW GARDENS, LONDON.

From one of those old "medicine gardens" dates the beginning of the wonderful establishment at Kew, England, which every amateur botanist in the world dreams of some day visiting. Slowly developing under successive owners through several centuries, the estate was leased as a residence by the unfortunate Frederic, Prince of Wales, and here his widow reared her son, who afterward, as George the Third, had an interesting difference of opinion with his American subjects on matters of taxation and kingly rights. That monarch obtained the freehold, enlarged the grounds and continued the improvements made by his parents. In 1840 the Royal Botanic Gardens, as they had come to be called, became definitely a public institution, which remains today the most important botanical establishment in the world. It has had associated with its conduct the immortal names of Hooker and Bentham, and it has added to botanical science a fund of knowledge which may never be equaled until there is another world to explore.

But Kew is more than grounds, gardens, collections and treatises. It is a great institution for the study of plants from every possible angle, their relationships, their habitats, industrial importance, climatic and soil requirements, their diseases and a hundred other matters. It is a world institution, not only having correspondence with learned bodies and individuals everywhere, but having what are practically branches in the shape of botanical gardens, forest observatories and experiment stations in all parts of the British empire.

This work was given great impetus by Sir William Turner Thistleton-Dyer, who was director of Kew from 1875 until 1905, when he became Botanical Advisor of the Colonial Office. Under his influence the usefulness of Kew to all mankind has been strikingly increased. A sound economist and man of imagination and breadth of view, as well as a thorough scientist, he saw that the problem of tropical production was not merely to make money for exploiters, but to furnish the products in abundance and at reasonable cost to those who had need for them. To do this meant that the right plants must be grown in the right localities by the right methods. The natives, on whose efforts the success of plantations depended, could be interested only by remuneration which would distinctly raise their standard of living, and this could be given only where right methods of crop-selection and culture were followed. To this humane and broad-minded policy the botanical work of the empire was definitely committed. The survey swept the world. If a plant had beauty or utility the question of its culture and extension was considered. No dictum derived from empirical knowledge stood in the way of a candid examination of any problem presented. To find the plant, then find the way to make its culture profitable, was the work to which Kew and its allies addressed themselves; and the results have been of incalculable benefit to the world.

The Botanical Gardens of Peradeniya, in Ceylon, have been declared the finest in the world. They are nearly a century old, having been established in 1821. The grounds are bounded on three sides by the river Mohaweliganga and are only four miles from the historically interesting town which bears the alluring name of Kandy. For a hundred years high talent, devoted enthusiasm and deep scientific knowledge have been given to the work of making these wonderful gardens. The same patient and skilful effort would have wrought wonders in Greenland, but under a tropic sun the result has been magnificent beyond description.

The Mohammedans believe that the Garden of Eden was located in Ceylon, and there is no doubt that the gardens of Peradeniya have made a finer representation of that ideal spot than imagination could ever depict. The beauties, the marvels of the vegetable world, the delightful fruit, the healing herb, all are there—and there is no angel with flaming sword to turn the visitor away. Avenues of lofty palms, wonderful lianas, giant bamboos and all those miracles of the vegetable world which loom so large in travelers' tales are here assembled for the visitor's delight. There are flowers of marvelous beauty and, as in the Garden of old, "every tree that is pleasant to the sight and good for food." There, too, is the tree of the fruit of

which if man should eat he would surely die. It is the upas-tree of Java.

This bewildering assemblage of beauty and marvel would well justify its existence if it served no further purpose than the information and delight of the visitor. But for the benefit of the grouchy utilitarian it may be said that they have added many millions (now we have him interested!) to the wealth of the world and there is scarce a household in civilized lands to which their benefits have not penetrated. Tea was imported into Ceylon for a thousand years. No doubt small, unsuccessful and forgotten attempts at its culture were made, but not until Peradeniya, by scientific and careful experiment, had shown the way, was the tea plant more than a curiosity. In 1875 a little less than three hundred pounds were exported. Now the production is two hundred million, twice the amount consumed in the whole United States. How much this means to the planters in Ceylon and the patient, humble workers of that land may be partly appreciated, but what it means to the millions of tea drinkers of the world, particularly among the poor, is beyond human computation.

The cultivation of cinchona is another illustration of what the botanic stations may accomplish. In the late seventies the culture had begun, but the commercial supplies still came from the bark of wild trees, harvested by the usual destructive methods. Supplies of quinine sold for ninety dollars a pound and people sickened and died because they could not pay the price. Now thousands of tons of the life-saving bark come from plantations of the east and the drug can be purchased at retail in New York for thirty-five cents an ounce.

But it is with the production of rubber that the most commercially important work of the botanic stations of Ceylon, Singapore and the east generally has been concerned. In showing how recent is the cultivation of rubber-producing plants perhaps the most impressive fact which may be cited is that in De Candolle's "Origin of Cultivated Plants," revision of 1884, not a single rubber plant was considered worthy of mention in the list of 247 species, though careful attention and exhaustive details were given in the case of such staples as skirret, rampion, quinoa, fenugreek, alexanders, sweet-sop, sour-sop and gold-of-pleasure. Ten years later saw the world unconvinced. Rubber importers scoffed. The forests were inexhaustible. Consumption would never catch up with supply. Reputable writers, scientists and practical rubber men declared that rubber plantations were an economic failure. Misguided planters peevishly cut down their trees, replacing them with other crops, and this fact was trumpeted to the world. But the patient, clear-headed men at the experiment stations went on with their work. With sure and large vision they saw the enormous magnitude of the prize for which they were contending—not for themselves, but for their country and the world. They sent to America for plants—*Hevea, Castilloa, Manihot*. Foolish men! exclaimed the critics. Do they not know that those trees will not grow outside of their original habitat?

It seems that the foolish men at the botanic stations did not know anything of the kind. They went on planting, cultivating, tapping and testing, distributing trees and plants, until now, thirty-eight years after the first trees were planted, a million and a half acres are set with the trees which "would not grow," and the product of the Malay States plantations alone is greater than was the whole world's production of rubber at the time the first experiments were being made. It seems certain that within a very few years the plantations of the east will furnish by far the largest part of the world's rubber supply.

Such has been the work of a few men of intelligence, imagination, conscience and energy, working mostly for salaries less than that of the chief cook in a modern hotel. While their critics were giving dire reasons why it never could be done these men were learning the requirements of the plant, placing it under the right sky, in the right soil and at the right elevation; they were testing every possible mode of culture and recording the results, noting failures as calmly as they noted successes; applying the science of chemistry to the product, making and testing the goods the world would want. They are still at their tasks in their quiet laboratories and gardens, still adding to the world's knowledge and the world's wealth and training the clear-eyed and clear-brained young men who are to come after them; while their erstwhile critics in far off lands are riding above tires made from the rubber they declared could never be grown.

If we consider the condition which the world would be facing if its supply of this indispensable article rested with those in control of the native forests; when we think of how the concessionaires would be calling for their pound of flesh and on second thought declaring that they must have two pounds; of the governments planning for more and more revenue and concocting schemes of monopoly and "valorization"; when we think of the continued destruction without replacement and a narrowing supply in the face of a growing demand, we realize something of what is due to the modest scientists who made possible the supply which stands between the manufacturers and the certain famine which would now be at hand.

In every land the policy of the stations is adapted to the facts which must be faced. In some parts of Africa the easygoing natives could never be induced to undertake plantations, and here they are skilfully persuaded to make each for himself a small planting in the forest near his own hut. They are taught less destructive methods of tapping; they are protected from exploitation and encouraged to become regular producers who will be more and more efficient as the years go by. All over the world the combined resources, learning and effort of the botanic establishments of the British Empire are directed to the task of teaching mankind how to profit in pleasure and wealth from the boundless treasures of the vegetable world. The man who discovers a gold mine does a poor and paltry thing compared with that done by the man who shows how an acre of ground can be made to yield pleasure and wealth for the succeeding generations of all the ages that are to come.

In America the botanic establishments are scattered from Canada to the Falkland Islands. There are twelve in the West Indies, or fourteen if Trinidad and Tobago be so classed. That of Jamaica has been in existence since 1779.

A number of the botanical gardens in the West Indies and Guianas have been described in considerable detail and illustrated by photographs in the accounts contributed to THE INDIA RUBBER WORLD by its editor or published by him in his book on the tropics. All of these botanical gardens, with the experiment stations usually conducted in conjunction with them, are under the management of botanical experts sent out from England, who as a rule are not only men of scientific attainments, but good organizers and well equipped for their varied executive duties. They take a profound interest in their occupation and work with the greatest diligence year after year to achieve substantial results.

In Jamaica there are two notable gardens and an experiment station. They have devoted much attention to rubber-producing trees, the *Heveas, Castilloas, Sapiums* and their own rubber vine, the *Forsteronia*. There is an interesting garden in Antigua, where a great variety of rubber trees has been tried in an experimental way, the *Manihots* especially having been carefully studied.

In Trinidad there is a wonderful garden and a splendid experiment station. Here are also the oldest and best specimens of *Hevea, Castilloa* and *Funtumia* in the West Indies. Tobago, which is really a part of Trinidad, has done much with *Castilloas*. In British Guiana, at Georgetown, there is a notable botanical garden, and many experiments have been tried in the planting of *Hevea, Castilloa* and *Sapium*.

The English colonies in the tropics all have extensive experiment stations, in practically all of which rubber culture is studied. They are found not only in the places mentioned above but in other parts of the West Indies and in British Honduras. They have also been established on a liberal scale in Southern India, Ceylon, Federated Malay States, Borneo, Northern Australia, Papua and in other islands. At some of these stations the *Hevea* is the principal subject of research work, while in others, as in Southern India, much attention has been given to the *Ficus*, and other indigenous trees. There are a number of these stations in the British possessions in Africa, where a great deal of painstaking study has been given to the *Landolphia* and *Funtumia* plants.

The interesting feature of all this experimental work in the British tropical possessions is the fact that wherever these stations are situated they all draw their inspiration from the gardens at Kew. They are practically all branches of those great botanical gardens near London. They all look to Kew for advice, instruction and assistance; it is the center that vitalizes all these ramifications. It is a wonderful system, admirably conducted, and has already achieved the most beneficent results, with greater results still to come.

SOCIÉTÉ FINANCIÈRE DES CAOUTCHOUCS.

The report presented to the general meeting of this Belgian company on June 10, shows a total area under inspection of 69,850 acres, planted or in course of being planted. Of this total, about 70 per cent. belongs to the various companies forming the combination, which holds a certain interest in the balance. The plantations are divided into three groups, controlled by the respective agencies, as follows: Federated Malay States, 11 plantations—34,750 acres; Sumatra, 10 plantations—31,250 acres; Java, 3 plantations—3,850 acres. Total 24 plantations—69,850 acres. While the technical inspection is in all cases confided to the company's agents, it is not in all instances accompanied by financial control.

During the past year the technical control of the company's Asiatic business was centralized in Mr. E. B. Skinner, formerly at the head of its Straits agency.

Although the balance of profits for 1913 represents about $560,000, the board has devoted about $540,000 to writing off depreciation in the companies' shares and other assets; the difference of about $20,000 being carried over to new account. The report states that it has been considered the wiser policy not to pay any dividend, but to devote the chief portion of the profits to the total extinction of the above-named depreciation; adding that the sudden fall in rubber could not this year be made up by an increased production. Hence the drop in rubber shares and the consequent depreciation of the company's assets.

Appreciatory reference is made to the late Mr. C. A. Haggenmacher, head of the Sumatra agency, who died in the early part of 1914.

While a large proportion of the company's plantations has not yet reached maturity, its holdings include some producing estates—such as: Kuala Lumpur Rubber Co., planted area 5,040 acres, 10 months' production, 984,603 pounds; Federated Malay States Rubber Co., planted area 4,800 acres, 11 months' production, 1,071,865 pounds.

This company's headquarters are at Antwerp; the administrative board including E. Bunge, E. Chenevière, de Lagotellerie, Alfred and Emile Grisar, Herbert Wright, and other prominent rubber men.

The exports of rubber waste from Rotterdam amounted in 1913 to 76,743 tons, an increase of 21,986 tons over the exports of the previous year, when of the 54,757 tons exported 39,545 tons were shipped to the United States.

COWBOYS' "CHAPS" BEING MADE OF RUBBER.

EVERYBODY is familiar, pictorially if not from actual observation, with the general aspect of the great American cowboy, and particularly with that distinctive feature of his dress which consists of a pair of leggings or overalls made of leather

SOUTH AMERICAN COWBOYS IN WOOL-COVERED "CHAPS."

or of sheepskin with the wool left on and that reach from the feet to the waist. The cowboy refers to these as "chaps," which is short for "chap-a-re-jos" borrowed from the Mexican.

These "chaps" are a highly essential part of the cowboy's equipment, as without them his clothes would be torn to tatters when he rides through the stiff underbrush. They are worn not only by the cowboys on the American plains, but by the men engaged in herding cattle on the great plains of Mexico, Argentina, Colombia, and practically everywhere else where there are cattle and cowboys to round them up.

But while these leather or sheepskin "chaps" render highly efficient service in places where the underbrush is dry, obviously they are not very well suited to climates where there is a great deal of rain and where vegetation is continuously wet; and that is the reason that the cowboys of the Colombian lowlands have resorted to "chaps" (though they call them "zamarros") of a different sort, namely, made of rubber covered with fabric on both sides. These, up to the present time, have all been made in England, but as these cloth-covered rubber "chaps" are obviously much better suited than their leather counterpart for work in wet weather, it is very likely that their use will spread wherever there are cows and cowboys; and if they are adopted, as they probably will be, in our own western country, they will naturally be made in American mills.

ALL-PLANTATION TIRES.

It is reported from London, that a number of car owners interested in the rubber industry have been ordering sets of "all plantation" tires. These will be submitted to full and complete tests under the supervision of experts.

The Rubber Club's Annual Midsummer Outing.

THERE is one event in the annals of the Rubber Club of America which is really an Event. While in no way disparaging the handsome way in which the New Yorkers treat the members at the annual midwinter banquet, yet for unadulterated good fellowship, good fun and a general good time, Boston's outing is considered just a little bit ahead—at least by Boston.

The Committee of Arrangements for the outing this year reverted back to first principles. The adoption of a country club grounds as a place of meeting had proved less popular than a trip on the blue ocean, where the tang of the salt air gave to the celebrants that hearty appetite which added so much to the appreciation of a shore dinner with its natural concomitants. Therefore the committee, remembering the hearty welcome accorded the club in former years by the officers of the Coast Artillery stationed at Fort Andrew, decided upon a repetition of the program of several previous outings on Peddock's Island, where the fort is situated.

Of course it would never do to omit the golf tournament as a feature of the outing, and Peddock's is not furnished with golf links. Therefore the enthusiasts of the driver and brassie were invited to a handicap play golf tournament at the Wollaston Golf

ARRIVAL AT FORT ANDREW WHARF.

Club, near Montclair, a suburb of Boston, on the morning of the day of the outing, one gross and two net prizes being offered. It was the intention that this tournament should be played so early that the participants might finish in time to reach the wharf in Boston to join the others before the departure of the boat at one o'clock. Some of the players became too absorbed and missed the boat, the ball game and the harbor trip, though they showed up at the club house at Point Shirley in good season for the shore dinner.

There were twenty-eight entrants at the tournament, and they kept busy. The cards showed the following records:

	Score.	Handicap.	Net.
Lawrence B. Page	83	9	74
Wallace G. Page	80	6	74
W. L. Pitcher	91	17	74
F. H. Jones	91	13	78
Philip E. Young	86	8	78
H. C. Benchley	96	18	78
E. C. Clark	86	7	79
Samuel Wright	93	14	79
Chas. Pastene	98	18	80
J. B. E. Wheeler	101	20	81
J. H. Learned	101	17	84
E. E. Wadbrook	106	20	86
H. C. Mason	102	15	87
F. L. Tufts	107	19	88
W. H. Miner	120	26	94

There were other participants who, however, did not hand in their cards.

The first three on the above score were declared winners, and suitable prizes were awarded them later in the day.

One o'clock saw a crowd of rubber men, in outing costumes, gathered at Otis Wharf listening to the sustaining strains of the Lynn Cadet Band and waiting with more or less patience for

DEPARTURE FROM FORT ANDREW FOR TRIP TO POINT SHIRLEY.

the command "All aboard." The steamer "Griswold" didn't exactly strain at her hawsers, but she was there ready to receive, with scrubbed decks, the embarking rubber men. Some time allowance was given after the appointed hour of departure for the tardy golfers, and the way some of them dashed down the wharf in automobiles would have meant fines for the chauffeurs had not the police politely turned their heads. Neat red cardboard discs, silver bound, were provided, on which each man wrote his name and thus introduced himself to his fellows.

A sound of whistles, a blast from the band, joyous acclaims from the passengers, and the "Griswold" started on its trip down the harbor with one hundred and fifty men on pleasure bent. The band, which has accompanied every one of the fifteen outings of the club, with Leader S. S. Lurvey, kept up a lively concert during the trip. Below, a light bunch of sandwiches and cold drinks was served, and this department was well patronized, in relays, from the beginning to the end of the trip.

Passing steamers saluted, private yachts dipped their colors and motor boats screamed a welcome to the excursionists.

Arriving at Peddock's Island the commandant was at the wharf

THE BOYS IN KHAKI CAME DOWN TO ENJOY THE GAME.

to welcome the party, which was escorted in columns of fours to the ball ground. Here the "fans" seated themselves on the green hillside and the ball players quickly donned their "uniforms" for the game.

These uniforms were, one might say, unique. They were outsizes of ladies' hosiery which the players were directed to draw on over their trousers and to fasten up by means of large toilet

pins. The stockings for the Married Men were of a cheerful "tango" hue, while the Single Men were distinguished by the color green, as considered most appropriate. The umpires were R. L. Chipman and W. H. Miner, who, to show their strict impartiality, wore a tango stocking on one leg and a green one on the other.

It was a great game, full of fine plays and finer fumbles. Some wonderful strikes were equalled by some marvelous catches and skilful put-outs. The fans applauded and manifested their disapproval, according to their judgment of the game or their partisanship, but no attempt was made to attack the umpires. As there were no casualties, Dr. Joseph C. Stedman, the official surgeon of the club, found no opportunity to exhibit his skill during the day.

MARRIED MEN.

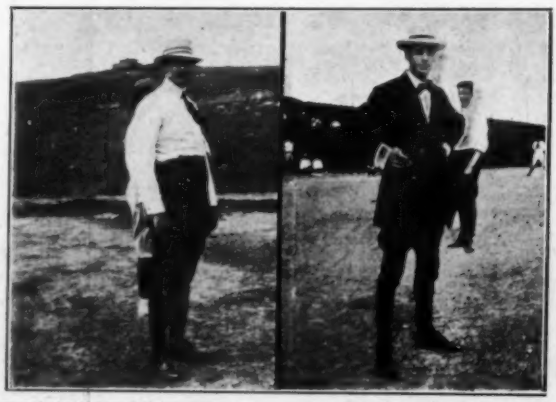
	Innings 1	2	3	4	5	6	7	
Pitcher, 1b.	..	..	..	..	..	..	..	
Finch, s. s.	..	..	..	..	1	..	..	
Clifford, p.	..	..	..	..	..	..	..	
Conlin, c.	1	..	..	..	..	..	1	
Glidden, 2b.	..	..	..	..	..	..	..	
Young, 3b.	..	..	..	..	..	..	..	
Woodbury, l. f.	..	..	..	..	..	..	..	
Wilson, r. f.	..	..	..	..	..	..	1	
Cutler, c. f.	..	..	..	..	1	..	1	
Total runs	1	..	..	..	2	..	3	= 6

SINGLE MEN.

	Innings 1	2	3	4	5	6	7	
Sweet, 1b.	1	1	..	..	1	..	..	
Clapp, s. s.	1	1	..	..	1	..	..	
Tyer, c.	1	..	..	1	..	..	..	
Bryant, 2b.	..	..	..	1	..	..	..	
Bass, 3b.	..	..	1	..	..	..	..	
Andrew, l. f.	..	..	..	..	..	..	..	
Bailey, c. f.	..	..	..	..	..	..	..	
Thomas, r. f.	..	..	..	..	..	..	..	
Feinburg, p.	1	1	..	1	1	..	..	
Total runs	4	3	1	3	3	..	..	= 14

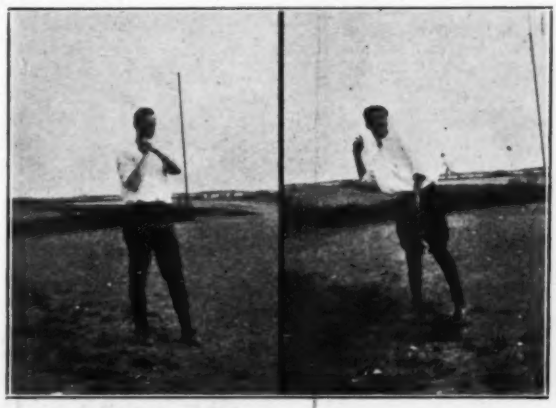
The married men scored only six runs to their competitors' fourteen, and seven innings was enough to show the superiority of the green stockings over the tango hosiers. A mighty cheer was given the victors and the band struck up a triumphal march. The steamer then tooted a warning that it was time to re-embark for the trip across the harbor to the Point Shirley Club House, where the dinner was to be served.

It was early in the afternoon, while the ball game was in



UMPIRE W. H. MINER. UMPIRE R. L. CHIPMAN.

progress, that the assembly was startled by a loud and sudden boom, followed by the "whee-ooo-whee-e-e" of a thousand-pound shell speeding through the air to a target five miles away. This served to inform the club members that the Coast Artillery was engaged in target practice at the other end of the island, and those of the party who were not so deeply interested in baseball proceeded over the hill to points of vantage where they could observe the *modus operandi* of attacking an invading navy in time of war. The observation station was filled with men, some with fine telescopes, mounted like theodolites, and others with telephones clamped to both ears, while down below in the charting rooms were others bending over a big table, plotting out locations by means of quadrants, rules and angles. Away down below in a hollowed semi-circle were the men at the big guns, which they were ready to deflect to any angle to right or left, up or down, as the word came by telephone from the conning tower. And then a tug at the rope, a boom, a roar which echoed from the shore and the distant islands, the sound of the thousand-pound projectile piercing the atmosphere, and miles away a splash which raised a white column of water to show that the shell had



JAMES J. CLIFFORD, PITCHER FOR MARRIED MEN. FRED FEINBURG, PITCHER FOR SINGLE MEN

fallen near enough to the moving scarlet pyramidal target to score a clean hit.

So absorbed were the spectators of these evolutions that special messengers were dispatched from the "Griswold" to warn them they would be marooned on the Island unless they hurried. They were loth to go, for no firing had taken place during the last hour, as the moving target had not been sighted. Hardly had the boat got under way again when the cannons thundered out once more, but the target was invisible to the passengers on the boat.

Arriving at Point Shirley the party was welcomed by many members who for one reason or another could not avail themselves of the afternoon programme. Here the excursionists found the space in front of the club house arranged for the quoit tournament, which was at once started. Over half a hundred contestants participated and by elimination the number gradually narrowed down until the final test was between R. S. Hodges and Henry C. Pearson, the former taking the set.

While this was in progress several Apolloesque members donned blue-and-white bathing suits and stood in a statuesque group while THE INDIA RUBBER WORLD photographer endeavored to secure a work of art for this page; but daylight had faded and the result was a failure.

The swimming contest was a dive off the float, a swim around the steamer at the end of the pier, back the other side of the pier, a wade ashore and a grasp of the hand of the judge. The swimmers finished in the following order: First, Walter H. Bass; second, P. E. Young; third, W. L. Pitcher; fourth, G. L. Finch; fifth, W. F. Thomas; sixth, Robert L. Rice.

Meanwhile the preparations for the dinner were going on. The piazza of the club house was used, a head table being set at one end while the remaining space was filled with small, round tables seating six or eight people. When the call to dinner came the assemblage was quickly seated, and at each plate was found some noise-producing instrument, which was immediately put into practical use, with a somewhat amazing result. Another

surprise was the menu, a sheet of rubber backed by friction lining, cut in the shape of a short boot and appropriately labeled, to which were attached by a bow of satin ribbon two boot-shaped leaves, one containing a list of the officers of the association and the other the bill of fare, which read as follows:

MENU

Cocktail
Clam Broth (in cups) Steamed Clams
Olives Radishes
Baked Chicken Halibut
French Fried Potatoes Lettuce and Tomato Salad
Louis Roederer, Carte Blanche
Broiled Live Lobster à la Point Shirley
Fresh Asparagus
Baked Indian Pudding Ice Cream
Crackers Cheese Demi Tasse

This menu made a fine souvenir of the occasion. It was designed by Committeeman R. L. Rice.

In the absence of President Hodgman, Vice-President Fred H. Jones presided. Seated at the head table also were: ex-Presidents John H. Flint and Henry C. Pearson, and Francis H. Appleton, Charles H. Arnold, Robert L. Rice, H. C. Mason and Secretary H. C. Vorhis.

"Joe" Work (everybody knows him) acted as host. He is a prominent member of the Point Shirley Club, and felt it incumbent on himself that the dinner should be thoroughly and completely satisfactory to every guest—and it was.

While the diners were busy the band played. Between courses the diners sang, instigated thereto by the band. And while the diners dined and the band played, two little maids, lured by the music, tangoed, hesitated and Castle-walked with grace and precision up and down the space between the club house and the beach, eliciting much applause—and some envy—from the diners.

There were no formalities—no speeches. Such are against the custom of the club; and custom is law. Vice-President Jones, however, proposed a toast to the absent president, Mr. George B. Hodgman, to which all enthusiastically responded. Captain Appleton, after long and persistent effort secured comparative silence and a show of attention. Then a toast was proposed to Henry C. Pearson, whom he referred to as "the founder and father of the club." The next toast was to the presiding officer, F. B. Jones, whom he designated as "the next president."

Prizes were awarded with informality; the names being announced and the winners receiving them from Mr. Jones. They were:

In the Golf Tournament—

Wallace G. Page, lowest net, silver and cut-glass cocktail mixer.

W. L. Pitcher, second lowest net, silver loving cup.

Lawrence B. Page, lowest gross, cigarette case.

In Quoits—

R. S. Hodges, first prize, gold cuff links; Henry C. Pearson, second prize, gold cuff links.

In Swimming Race—

W. H. Bass, first prize, gold handled pocket knife.

It was after nine o'clock when the "Griswold's" whistle gave an admonitory blast. Not long after lines were cast off and the trip across the harbor in the cool of the evening was far from the least enjoyable portion of the day's program. And when the members arrived at the Boston dock and parted for their several destinations it was with most hearty adieux and with a unanimous verdict that the fifteenth outing was the best in the history of the club.

MEMBERS OF THE RUBBER CLUB AND THEIR GUESTS AT THE MIDSUMMER OUTING.

The Production of Sulphur.

ASIDE from rubber itself the most important constituent of rubber goods is sulphur, and were it not for the plentifulness of the substance and the ease with which it can be obtained in a state of purity much more attention would have been paid by rubber manufacturers to its production and manufacture.

Sulphur is found native in many parts of the world and was known and used from earliest times, and its compounds are among the most widely distributed, as it is found combined in many classes of minerals. In fact so abundant is sulphur that nearly as much expense is involved in preventing it from becoming a nuisance as in the small proportion utilized; for it is safe to say that ten times as much sulphur is burned up and wasted or lost every day as is used. This is on account of the location of the sulphur bearing minerals, which are usually found in sparsely settled parts of the west, while the demand is in the east. Of late years, however, a large amount of sulphuric acid has been produced from sulphur found in zinc and copper ores and is a by-product of the manufacture of these metals. Still a large amount of sulphur ores in the form of pyrites or iron sulphide is imported from Spain for use in making acid in the east. Notwithstanding the abundance of ores consisting of sulphides or sulphur-containing ores, practically all the sulphur used in the world is found in the native state and is purified and brought into market with little expense except for freight.

Up to recent years the largest production of sulphur was in Italy, and particularly in Sicily, where for ages it has been mined and refined in a crude and primitive way. The industry was controlled and carefully watched over by the Italian Government and prices were kept up, as the world was dependent on this source. As illustrating the conditions in 1896 we may mention that an Anglo-Sicilian sulphur trust was reported on in September of that year in the United States Consular reports stating that an export tax of 11 lire per ton was then in force. The United States then consumed about one-third of the Sicilian product, or, say, 110,000 tons annually. Commenting on the situation at that time a mining journal stated that the increase in price of sulphur owing to the workings of the Sicilian combination had stimulated the development of American supplies and that more developments might follow. It referred to a report of the opening up of Texas deposits and expressed the hope that this work might progress to such an extent that it would have some influence on the market.

The above shows our dependence at that time on Sicily for our sulphur and that we were at the mercy of a trust and a government which was disposed to tax exports "all the traffic will bear."

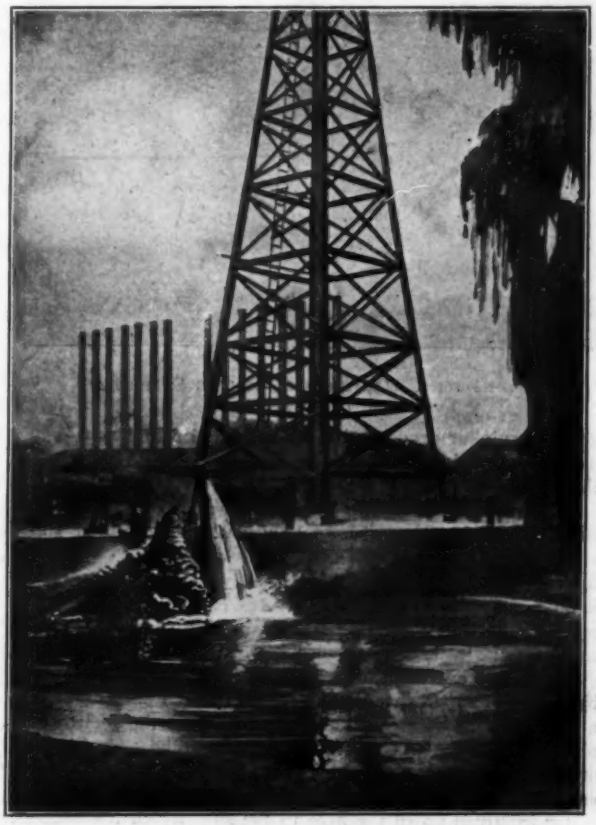
The Sicilian method of extraction consisted merely in mining the limestone with which the sulphur was mixed, piling it in large stone kilns and setting it afire. About one-third of the sulphur was burned up in heating the rock, while the remainder melted and ran out at the bottom.

This method would never have succeeded in the United States, where it has been found that many industrial methods have had to be adapted to our peculiarities before we can make the products made in the old world. Our method of extraction is a striking illustration of the above, and we have arrived at a point now where we have entirely revolutionized the methods of producing sulphur and have not only become able to supply our entire demand for this article, but we could, if we wished, supply the entire world, the Sicilian industry surviving only on our sufferance.

This revolution in the sulphur business has been brought about practically by the efforts of one man—almost unknown to the rubber trade—whose recent death makes appropriate something of the story of his life and accomplishments.

Herman Frasch came to this country as a boy of 16 in 1868, getting a position with a pharmacist. In 1874 he established a laboratory of his own and in 1876 invented a process of refining paraffine wax which was adopted by the Standard Oil Co., with which he was afterwards employed.

It was after he had left that company and had formed the



WELL DISCHARGING MOLTEN SULPHUR.

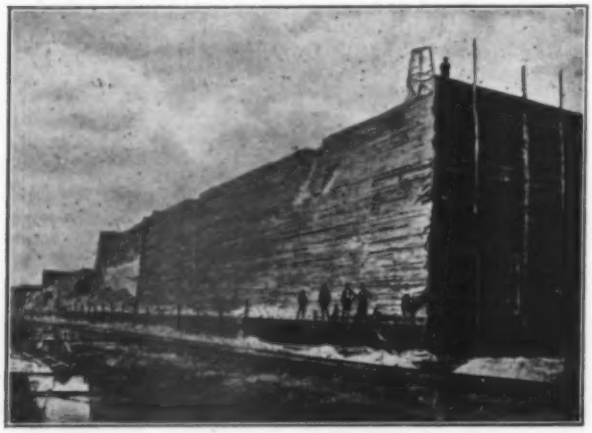
Empire Oil Co. of Canada, and had built a factory there, that his first epoch-making invention was completed, which, while it related to sulphur, was for eliminating this element from oils. It had been easy to refine Pennsylvania oil, as it contained no sulphur, but when the Ohio and Indiana oils and the Canadian oils were thus simply treated they were found to be useless on account of the sulphur which they contained and which clung to them.

They sometimes contained as much as one per cent. of sulphur. Mr. Frasch studied out a method of purifying these oils by using oxide of copper, which united with the sulphur and held it back in the still while a sweet refined oil distilled over, thus making the Ohio and Canadian oils as valuable as the Pennsylvania oils had been.

In 1888 he had a large plant established for working this process, which the Standard Oil Co. bought, with the patents,

after he had proved by actual competition with them that by this means only could they get a salable product from the oils of Ohio and Canada. It would probably have been less expensive for the Standard managers if they had recognized his abilities and paid him a salary that would induce him to stay with them rather than go out and become a competitor, but it is often necessary to sell brains with a club. He was paid in stock worth then 168, half of which he sold after his process was applied for at 820 a share, as this was the market price which had been created by the profits of his process.

It was in 1890 that Herman Frasch applied for his patent on the production of sulphur which has made this country the



BINS FOR COLLECTING AND COOLING SULPHUR.

greatest sulphur producer in the world and promises to make it the sole producer when in the future it decides to go after the trade of the world.

It had long been known that there was a large deposit of sulphur in Calcasieu parish in Louisiana at a depth of about a thousand feet, but as this deposit was covered with quicksand for nearly the entire depth no one had yet succeeded in mining it on a commercial scale though there had been many efforts, especially during the war, when it was needed desperately by the south for use in making powder.

Mr. Frasch evolved the idea of melting the sulphur in place by means of superheated water forced down a bore hole from a large battery of steam boilers and forcing the melted sulphur up with the water through an inner tube. He had had much experience in drilling oil wells and had also been interested in the production of salt where a well is driven and water is forced down the hole to the salt, which it dissolves, the resulting brine then being pumped to the surface. But nobody had ever before run a large set of boilers where the feed water was pumped in through the steam pipe and the water continually drawn off through the blow off. This reversal of procedure is what makes it revolutionary in its conception.

Of course, a method of proceeding so radically different from the orthodox was sure to bring out criticism and prophecies of failure, and Mr. Frasch himself told a story to illustrate the sentiment in the neighborhood. He described how the hot water was first turned into the wells and how they feared that it would cool down and let the sulphur freeze in the pipes before it got to the top of the ground, but after forcing in the hot water for twenty-four hours they decided to begin pumping and soon there came a stream of sulphur from the pressure vessels into which the water and sulphur were pumped. It filled 40 barrels in 15 minutes and having no more barrels they threw up embankments to hold it; and since that time no barrels or movable vessels have been used to hold the melted sulphur.

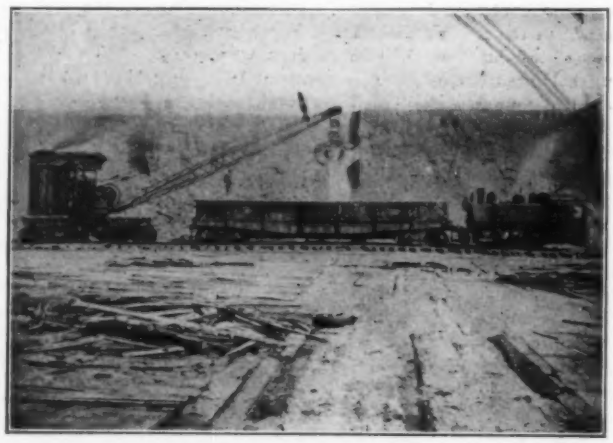
When everybody had gone home Mr. Frasch mounted the pile of solidified sulphur and listened to the noises produced by contraction of the cooling sulphur, which he regarded as a greeting from below—proof that his object had been accomplished.

To show the success of this method of pumping sulphur it is only necessary to quote the figures of imports and exports of sulphur from the United States.

In 1903 the United State imported 188,000 tons of sulphur and exported none. In 1907 we imported 20,399 tons and exported 35,000, showing that we then produced a little more than we consumed. At present this country is supplied with sulphur from these Louisiana deposits, using the Frasch process, and it might supply large quantities to Europe were it not that the broad-minded and large-hearted men in control could not be induced to bring starvation and ruin on the two hundred and fifty thousand miners in Sicily. To illustrate the difference in labor it may be mentioned that now 700 laborers produce 250,000 tons of sulphur per year in Louisiana.

To give some conception of the magnitude of this industry and to illustrate the methods of work—as well as can be shown in above ground views—three photographs are herewith reproduced, the first showing a well discharging 500 tons of molten sulphur per day with its derrick prominent in the foreground, and in the rear a boiler house for supplying the hot water. The row of smokestacks gives an idea of the magnitude of the boiler installations. The sulphur deposit seems to be circular and about one-half mile in diameter, and the sulphur beds extend to a depth of about 1,100 feet and consist of approximately 70 per cent. sulphur and 30 per cent. limestone.

The installation comprises 25,000 H.P. of boilers, making it one of the largest in the world, but as oil only is used, it requires but three men on each shift to attend them. They consume a million barrels of oil per year and use 7,000,000 gallons of water per day, which is pumped seven miles. The



BLASTING THE SULPHUR TO LOAD ONTO FLAT CARS.

wells are sunk in groups and will run for several months, producing sometimes 500 tons per day, but after a time they fill up, when others take their place.

It was early discovered that while it was easy to force the hot water from the boilers down the outside pipe and that it would melt the sulphur in the ground, yet to pump up this water and melted sulphur was difficult, as nearly every metal was soon eaten out. The method of pumping with an air

lift was then adopted, and it forces up a stream—of the size shown—of a mixture of hot water and melted sulphur. The sulphur comes up so free from impurities that it is guaranteed 99.5 per cent. pure and runs considerably better than that.

The sulphur is collected and cooled in large bins about 150 to 250 feet square, made by setting posts into the ground and nailing 2-inch planks to them. As the sulphur is delivered into the center of the bins and spreads out into layers 3 inches thick it cools so rapidly that continuous operation is possible. A separate bin is used for each well so that a record of its production can be kept. As the sulphur rises the bins are raised by more planking till they are sometimes over 60 feet high. When one is full another is built alongside, so that

Herman Frasch.

continuous blocks of sulphur are formed. One of them is shown in the second illustration which contains over 100,000 tons of sulphur; which is more than we used in 1896 in the entire United States. When shipment is to be made a track is laid alongside the sulphur, which is blasted down and picked up with a 2-ton locomotive crane shovel and loaded into flat cars—as shown in the third picture—and a 35-ton car can be loaded in 14 minutes. While some of the sulphur is loaded directly into box cars at the works with a box car loader, and shipped direct, most of it is shipped to Sabine Pass, Texas, where it is loaded into steamers for the north and for Europe. The company owns one steamer of 5,500 tons register, named the "Herman Frasch," and employs several more in distributing its product.

Herman Frasch, to whom this development is due, died in Paris on May 1 of the present year. He received the Perkin Medal in 1911 for his distinguished services. This medal is awarded annually by the associated chemical societies of the United States for distinguished work in chemical science and is an indication of the honor in which the recipient is held by the brother members of his profession.

This deposit of sulphur in Louisiana, while being the most remarkable, is not by any means the only deposit of the kind, and there is said to be a large similar deposit near Freeport, Texas, which was discovered in boring for oil. A syndicate has bought it up and has installed a large plant on it similar to the plant described above, but the shipments as yet have not been heavy.

About three miles from Cody, Wyoming, there is a deposit of native sulphur said to be of varying thickness from 60 to 75 feet, lying about 7 feet below the surface, and drill holes show the presence of about a half million tons of sulphur. As the fuel cost is low, owing to the fact that the company owns a coal mine nearby, they are mining about 25 tons per day by digging it up and throwing it into a retort and steaming out the sulphur with steam at 60 pounds pressure. The sulphur of course liquefies and can be drawn off from the bottom.

There may, in the future, be a large quantity of sulphur thrown on the market as a by-product of smelting copper ores, as in many localities—notably California—the smelters have been closed by court injunctions on account of the sulphur fumes, which destroy the vegetation for miles around.

There are now two prominent processes being tried out for saving this as metallic sulphur and so avoiding the production of the sulphurous fumes. One of these is known as the thiogene process and is based on the reduction of the sulphur gases to free sulphur by passing them over hot lime while spraying with crude oil. This process has not yet been perfected on a commercial scale. If it should be it would furnish an unlimited amount of sulphur. The Hall process operates on another principle, namely, that of roasting off the sulphur in a closed vessel from which the air is excluded to prevent the formation of sulphur gas fumes. This is usually done by roasting with oil, using a spray and a very limited amount of air, and at the same time blowing in steam. The process has been introduced at a large smelter in Shasta County, California, but its success is not yet assured. Should it prove successful the Shasta County smelters alone would produce twice as much sulphur as the United States now consumes.

While rubber men foresee a large expansion of the rubber industry on account of the cheapening of the plantation gum, which will compel them to consume much greater quantities of sulphur in the future than they have in the past, it will not be necessary for them to worry as to a future supply of this article so necessary to their industry. From the present viewpoint there will always be sulphur enough, and to spare.

INDIA RUBBER GOODS IN COMMERCE.

EXPORTS FROM THE UNITED STATES.

OFFICIAL statement of values of exports of manufacturers of india rubber and gutta percha for the month of April, 1914, and for the first ten months of five fiscal years, beginning July.

Months.	Belting, Packing and Hose.	Boots and Shoes.	All Other Rubber.	Total.
April, 1914	$197,510	$59,652	$638,776	$895,938
July-March	1,779,984	911,576	5,442,555	8,134,115
Total, 1913-14	$1,977,494	$971,228	$6,081,331	$9,030,053
Total, 1912-13	2,155,168	1,266,807	6,849,469	10,271,444
Total, 1911-12	1,918,285	1,323,060	5,984,379	9,225,724
Total, 1910-11	1,742,683	1,894,282	5,198,295	8,835,260
Total, 1909-10	1,580,088	1,593,696	4,082,427	7,256,211

The above heading, "All Other Rubber," for the month of April, 1914, and for the ten months of three fiscal years, beginning July 1, includes the following details relating to tires:

Months.	For Automobiles.	All Other.	Total.
April, 1914	$304,385	$48,562	$352,947
January-March	2,378,959	440,966	2,819,925
Total, 1913-14	$2,683,344	$489,528	$3,172,872
Total, 1912-13	3,115,279	494,101	3,609,380
Total, 1911-12	2,063,603	467,290	2,530,893

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

WHAT THE RUBBER CHEMISTS ARE DOING.

[Extracts from recent articles on the Chemistry of Rubber which have appeared in some of the foreign publications.]

THE ACTION OF COPPER AND OTHER METALS ON RUBBER.

IN the "Gummi Zeitung," vol. 28, page 1280, F. Frank and E. Marckwald publish an investigation on "The Action of Copper and Other Metals on Rubber." The authors examined a number of decomposed rubber-insulated cables. In some cases the decomposition was such that the insulation was soft and sticky while in other cases hardening in the insulation had resulted. It was observed that the tin plating of the copper wire had been corroded in every case where the decomposition of the insulation had resulted. This corrosion of the tin plating resulted in the copper being attacked, and it was possible to identify copper sulphide wherever such corrosion of the tin had taken place. It was found on analysis that the insulations of the cables which showed no tendency to decompose had a vulcanization coefficient of 4.5. The tin plating on the copper wire had not been affected and only very small specks of copper sulphide could be observed on the wire. Careful examinations revealed no trace of copper in the insulation.

In the case of the decomposed cables, the analysis showed a much lower coefficient of vulcanization, and also a much lower total sulphur content, the coefficient being in the neighborhood of 1 as opposed to 4.5 in the case of the satisfactory insulations. As only traces of free sulphur were present in the decomposed insulations, it was evident that an error had been made in the weighing out of the sulphur, with the result that under-vulcanization had resulted. It was easily possible to identify copper in the decomposed insulations. The rubber substance of the decomposed insulations was completely soluble in acetone, only the inorganic minerals remaining behind after extraction with this solvent. This acetone extract on purification with petroleum ether yielded a hard brittle product, free from nitrogen, and containing 2.7 per cent. mineral matter. The analysis of this material, after allowing for the mineral matter, gave the following values:

Carbon	73.21 per cent.
Hydrogen	9.19 per cent.
Sulphur	1.43 per cent.
Oxygen (by difference)	16.17 per cent.

The analysis shows the material to be a highly oxidized product. In the presence of the copper, therefore, the under-vulcanization has brought about the high state of oxidation of the rubber.

As a result of their investigation the authors arrive at the following conclusions:

(1) The composition of the rubber insulation must be such that a quick and reliable combination of the sulphur and rubber results.

(2) The vulcanization should be a quick one, a high temperature being resorted to if necessary. By the latter means it is always possible to cure in a very short period of time.

(3) The tin plating on the copper wire must be uniform.

(4) Under-vulcanization, even with a subsequent after vulcanization, is not permissible.

THE COAGULATION OF HEVEA LATEX AND ITS BEARING ON THE STRENGTH OF RUBBER.

In the "Journal of the Society of Chemical Industry," page 289, Newton W. Barritt contributes an article on "the Coagulation of the Latex of *Hevea brasiliensis* and its Bearing on the Strength of Rubber." The author carried out a large number of test tube experiments on the coagulation of fresh *Hevea* latex in solutions of varying concentrations of acid and salt. The acid concentrations varied from five-hundredth normal to twice normal, while the salt concentrations varied from one-hundredth normal to twice normal. Standard solutions of acid and salt were run into the test tubes to make the required strengths and ½ cc of fresh latex was then added to each tube. The liquid was thoroughly stirred to effect complete decomposition of the latex, and allowed to stand for 24 hours to insure equilibrium. The tubes in which coagulation was just short of completeness were then noted and the acid and salt concentrations plotted on squared paper with the concentrations of acid as abscissae and concentrations of salt as ordinates. All points within the curves show concentrations of acid and salt at which coagulation does not take place, while all points above the curve show concentrations of acid and salt at which coagulation is complete and no caoutchouc globules are to be found in the serum.

It was found that the coagula formed by high concentration of salt at points distant from the curve were tougher and stronger in texture than those found at low concentration of salt, which latter were soft and spongy. It was also found that the water-absorbing capacity of the coagulum varies inversely as the concentration of salt in the serum. The inhibiting effect of acids on coagulation increases with increase of concentration of acid up to a certain maximum. Beyond that, in the case of hydrochloric and sulphuric acids, the inhibiting effect begins to diminish with increasing concentration of the acid, until at a concentration of N/2, coagulation takes place without the addition of salt. With acetic, lactic, and phosphoric acids further increase in concentration has no effect, and these acids are unable to produce coagulation at any concentration in the absence of salt. The comparison of the coagulating effect of various salts shows that the valency of the radicals does not appear to exert much influence. According to Seeligmann, *Hevea* latex from Brazil contains 55 per cent. water and 9 per cent. mineral salts. The author suggests that it is very probable that this high salt concentration is a factor determining the superior quality of Brazilian rubber, and that the dilution of the latex by the direct addition of water and acid solution, as practiced by the eastern plantations, is largely responsible for the inferiority of plantation rubber. This theory would also account for the variation which exists among plantation rubbers, even from the same estate, since it has been shown that the yield and composition of the latex vary considerably with respect to percentages of caoutchouc, protein, and ash, according to length of tapping, age of trees, and rainfall. In order to obtain uniform quality it would appear necessary to insure uniform compositions of the latex, especially regarding its ash and protein contents and concentrations.

The author has experiments in progress which are intended to throw light on this point but postpones discussion of the results until vulcanization tests of the samples have been obtained.

THE VISCOSITY OF RUBBER SOLUTIONS.

In the "Journal of the Society of Chemical Industry," vol. 33, page 446, R. Gaunt publishes an investigation on "The Viscosity of Rubber Solutions." In making up the rubber solutions for the viscosity experiments, it was observed that greater quantities of rubber yield a rather more than proportionate amount of dissolved matter to the same quantity of solvent. It would therefore appear that the dissolved rubber causes a partial solution of the insoluble constituent. For the subsequent investigations the author used samples of (a) Pale Fine Plantation Crêpe, *Hevea;* (b) Fine Hard Para; (c) *Castilloa;* (d) *Funtumia* Sheet; (e) Ceara Biscuits.

Of these rubbers Fine Hard Pará is the most insoluble, especially in the unwashed condition. By passing the Fine Hard Pará through a washer for 45 minutes in a stream of cold water, the solubility is considerably increased. Heating with solvents also increases the solubility. The viscosity of rubber solutions varies greatly with different solvents. Benzol and chloroform produce solutions whose viscosity is

much greater than is that of gasolene or ether solutions. Especially in the case of the plantation rubber is a marked difference observable between the viscosity in benzol and the viscosity in gasolene. In comparing the viscosities of different rubbers in the same solvent, it is necessary to make a correction for the amount of resin present in the rubbers. On making this correction, viscosity curves for Fine Pará and *Castilloa* practically coincide. Furthermore, the lowering of the viscosity due to washing the rubber on the mill in a stream of cold water is greater in the case of Fine Pará than in the case of *Castilloa*. For connecting the viscosity of solutions with the concentration, the author suggests the use of the following logarithmic equation:

$$\eta = K^x$$

where η_x = viscosity at concentration X, x = concentration, and K = constant.

By plotting the logarithmic viscosity against the concentration, straight lines were obtained in the case of the rubbers examined and the author suggests that the inclination of these lines with the abscissa would seem to be the simplest way of numerically comparing the viscosity of rubber solutions.

Both heat and light bring about a lowering of the viscosity of rubber solutions. At high temperatures the effect of light appears to be less marked than that of the heat. In fact, the effect of light began to make itself felt only after two hours under the simultaneous action of heat. It was observed that heat alone, in the absence of air, caused decrease of viscosity. The action of heat, therefore, is to decrease the viscosity of rubber solutions, apart from any oxidation which the rubber may undergo. The rate of diminution of the viscosity varies with the time of heating, being greatest at the commencement.

Experiments were also carried out to determine the change in viscosity of Plantation Pará in different solvents when heated to 80° C. The change is more marked in the case of xylol solutions than in the case of benzol and toluol solutions. In purified toluol, the diminution is less than in commercial toluol. A similar difference is observed between solutions in pure benzol and solutions in 90 per cent. benzol. The effect of the addition of small quantities of the usual impurities in benzol (carbon disulphide, thiophene and xylol) was determined. Only xylol caused an increased diminution in viscosity. A rubber solution of benzol containing 0.5 per cent. xylol decreased in viscosity much more rapidly than did the pure benzol solution. In order to determine the decrease in viscosity of different rubbers under the action of heat, solutions of equal viscosity of the different rubbers were taken and their viscosity redetermined after the heat treatment. It was found that the percentage decrease of the *Hevea* rubbers was greater than that of the *Funtumia*, *Castilloa*, and Ceara rubbers. The author explains the decreases in viscosity as being due to a de-aggregation or depolymerization of the rubber molecules.

VANADIUM AND TUNGSTEN AS COMPOUNDING INGREDIENTS.

Chemical compounds derived from the commonly occurring minerals have been used in rubber compounding since the beginning of that art, and today when the writing of recipes is getting to be a science, the original line of mineral substances is still being used.

Since our manufacturers have enlisted the services of research chemists they have, however, added to the number of suitable mineral fillers. These indefatigable workers have explored the domain of "rare" metals and the results of their labors are being given to the consumer in the form of "long life" rubber goods.

At Primos, Pennsylvania, Walter M. Stein has been conducting experiments with the aid of Vanadium Pentoxide (*V-2, O-5*) and Tungsten Trioxide (*Wo, O-3*). The preliminary work on these oxides seems to indicate that they are useful as "toughening agents" and as "accelerators." With this as a beginning may we not hope to see a "Hole-Proof Gum Shoe" or a "Knotair Firehose" ere long? The preliminary reports state that less than five per cent. of either oxide will influence the properties of the compound to a marked extent. In fact it may be necessary to use the oxides in Hahnemannian doses in order to obtain the maximum toughness in the compound.

Surely the Automobile Set will wish Mr. Stein unlimited success in this new application of Vanadium and Tungsten compounds, for the selfsame oxides are even now being successfully used for toughening no less a thing than steel!

INTERESTING LETTERS FROM OUR READERS.

WILLING OTHERS SHOULD GET THE SYNTHETIC PROFITS.

TO THE EDITOR OF THE INDIA RUBBER WORLD, Dear Sir: Your interesting editorial on the latest synthetic rubber (which includes resins in its composition) remainds one of the inventor who produced synthetic milk so perfect that cow hairs had to be strained out of it. If rubber can be produced at eight cents a pound, the benefit ought to be for the whole race instead of the fortunate few who manage to be the first to get to the window with their million dollars to buy the stock of the company. The capitalization ought to be a hundred million at least in order to give a hungry and clamorous public a chance to get in on the ground floor. That the public right may be maintained there ought to be a federal law by which the owners of great secrets of this character should be compelled to perform their magic arts in the government laboratories at Washington before they sell any securities to the public. They should have every help and facility, and if they can make rubber out of sawdust or frozen potatoes the certificate of government chemists that they actually had done the thing would well repay them for their time and trouble.

If, on the other hand, they need eight pounds of sawdust, eight pounds of tree rubber and four pounds of frozen potatoes for every eight pounds of synthetic rubber produced, it would be shown that the latter was not manufactured so economically as to warrant the expectation of large dividends on extensive capitalization, and the promoters would be advised to form a close corporation for the exploitation of their invention and especially not to use the United States mails in connection with their stock-selling until they were able to reduce the amount of tree rubber going into their synthetic product. Meantime, I shall not join the rush for the new securities. I am not selfish and do not wish to be the envy of my fellow-men. ALTRUIST.

PROTECT PLANTATION RUBBER FROM SPLINTERS BY WRAPPING IN GLAZED SHEETING.

TO THE EDITOR OF THE INDIA RUBBER WORLD, Dear Sir: Mr. H. W. French's timely letter in the June number of THE INDIA RUBBER WORLD *re* wood splinters reminds me of the remedy suggested by a brilliant Boston superintendent and chemist, namely: Before packing plantation rubber in the East it should be wrapped in glazed sheeting such as is used in keeping uncured tape from sticking together. This is said to come one yard wide, and moreover is cheap.

Boston. QUINCY TUCKER.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE tax returns now in show some interesting figures relating to the rubber business of this city, in comparison with those of last year. The returns of the B. F. Goodrich Co.—whose capital stock is $90,000,000—while not in excess of those of last year, amount to $19,920,000, of which $12,497,500 is in Akron personal property and $4,422,500 in Akron real estate. The Goodyear Tire & Rubber Co's. returns are $5,184,980, an increase of $420,730 over those of 1913. The returns of the Firestone Tire & Rubber Co. are $5,227,344, of which $4,021,314 is in personal property and $1,206,030 in real estate. The returns of this company in 1913 were $2,481,500. The Whitman & Barnes Manufacturing Co. returns are $395,790, against $324,850 in 1913; the Rubber Products Co. $227,930, against $58,200; the Mohawk Rubber Co. $70,500, against $22,280, and the Adamson Machine Co. $147,320, against $102,280.

* * *

The industrial committee of the Akron Chamber of Commerce is making efforts to persuade capital to bring to or establish in Akron other industries beside rubber, as it is felt that the city is becoming industrially unbalanced owing to the extent of the rubber goods production; and a new line of railway, known as the Akron, Canton and Youngstown, recently put in operation and affording largely increased shipping facilities, is mentioned as an additional inducement to the natural advantages of the city.

* * *

The touring bureau of the B. F. Goodrich Co. has been adding year by year to its statistical information, maps, etc., until during the present season it has placed at the disposal of the touring public route books and information obtained from actual surveys covering more than 300,000 miles of road —the best touring roads in the United States and Canada— on much of which Goodrich road markers, to the number of 45,000 or more, have been set up. This bureau also supplies a book covering the rules of the road, as well as a European route book giving customs regulations of the principal foreign countries and valuable information on how to ship cars and how to get about on the Continent. These route books, etc., may be obtained at any Goodrich branch or on request to the company at Akron.

During the recent Ohio State Convention of the United Commercial Travelers, held in this city, about 600 delegates visited the Goodrich plant, making an inspection of the various departments—tire, belting, molded and mechanical rubber goods, etc.—in all of which they were much interested. The feature that impressed them the most, however, was the "safety first" idea as carried out in the plant by means of numerous devices for the protection of workmen.

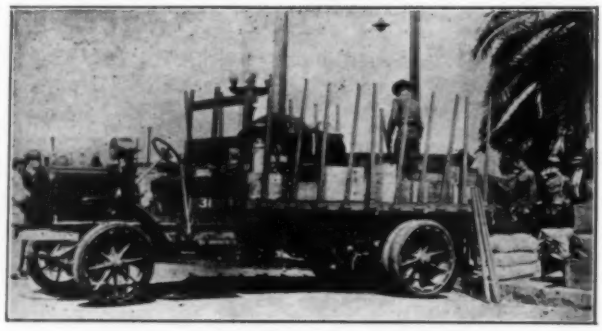
* * *

The Firestone Tire & Rubber Co. has recently installed an industrial library. Any person employed by the company, whether in Akron or its branches, has at his command all the reading matter that pertains to his particular line of work. This is collected and classified by the chief librarian and his assistants. The research staff works constantly over the newspapers, magazines, trade journals and books, and this matter is indexed and distributed in such a manner as to be most helpful to the employes, for whose benefit it is also planned to open a correspondence course. It is expected that this library will be extended to cover books on personal efficiency and home and social economics, so that the general education of the employe will be provided for.

An outing which included a fifty-mile automobile trip, athletic sports, entertainment and an old homestead dinner at the Firestone homestead in Columbiana county, was recently tendered by H. F. Firestone to the foremen of the company's factory in this city.

* * *

The accompanying illustration shows a five-ton motor truck in the service of the United States Army, transporting American soldiers from San Diego to the Mexican border. The motor truck has many advantages over the old-time



MOTOR TRUCK FOR ARMY SERVICE.

mule-drawn vehicle for army purposes, and especially in the saving of time it effects, the truck shown, equipped with Firestone solid tires, having made the trip from Los Angeles to San Diego—a distance of 148 miles—in 13 hours.

* * *

W. E. Young, as administrator of the estate of Homer A. Hine, has filed suit in the Common Pleas Court of Summit County, asking that a receiver be appointed for the Star Rubber Co., located at 1025 Sweitzer avenue, this city, and that the property be sold to satisfy the demands of creditors. It is stated in the petition that Mr. Hine died March 28, having endorsed negotiable paper for the Star Rubber Co. amounting to forty thousand dollars, thirty thousand dollars of which is past due. C. I. Bruner, of the First-Second National Bank of Akron, was appointed receiver to take charge of the affairs of the company pending liquidation, and a motion has been filed, asking for appraisers to be appointed. Mr. Hine was secretary and treasurer of the Star Rubber Co. and very active in its affairs, and his untimely death has precipitated matters that, had he lived, would doubtless have been taken care of.

* * *

The Kelly-Springfield Tire Co. has just moved into new factory offices in Akron, which are commodious and modern in every particular. F. E. Holcomb, superintendent of the company, is slowly recovering from a siege of rheumatism. He is at present at Mount Clemens, Michigan.

* * *

The Portage Tire & Rubber Co. has extended its field into the rubber sole and heel trade.

* * *

The Akron City Fire Department has recently sold the last horse belonging to the department and has installed the latest automatic steam and gasolene fire apparatus, with substantial rubber tires.

* * *

The factory workers of Akron express themselves as well pleased with the workingmen's compensation law now in force in this state, describing it as "the best and biggest thing that has ever been done for us." Among the rubber workers who have experienced the benefits of its operation are the following: Charles Brown, who suffered a broken finger while working in the plant of the Firestone Tire & Rubber Co. and was unable to work for three weeks, had his position held open for him, received pay for the lost time and the amount of his doctor's bill. Frank Palmer, also injured at

the Firestone plant, received an award of $85.71. Arthur R. Robinson, injured in the Goodyear plant, received an award of $58.29. John Gruber, also injured at the Goodyear plant, $36. Gust Savage and Adam Wagner, for injuries received in the plant of the Kelly-Springfield Tire Co., were awarded respectively, $733 and $48.77.

* * *

It is said that the Goodyear Tire & Rubber Co. has already purchased the $350,000 of its preferred stock which it is required to retire annually beginning with the next fiscal year —one year in advance of the stipulated period.

* * *

Two Akron balloon pilots—R. A. D. Preston and R. H. Upson—will be entered in the international race for the James Gordon Bennett trophy. Preston has qualified for the event by winning the national elimination contest in the balloon "Goodyear." With M. D. Tremelin, of Akron, as his aid, Pilot Preston covered approximately 300 miles in the contest which started from St. Louis, July 11, under the auspices of the Aero Club of St. Louis.

Another American entry in the forthcoming race is H. E. Honeywell, of St. Louis, who secured second place in the last international.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE midsummer season finds trade somewhat below normal but on the whole satisfactory, when all factors are considered. To be sure, the rubber footwear business is very quiet, as far as overs and boots are concerned, but the tennis demand has kept up wonderfully, and this has been a banner season, with another month yet to be added to the already high record. The automobile tire business is better than earlier in the season. This is accounted for by one leading agent as a result of economy early in the season, when automobilists, instead of starting out with new tires, determined to get all they could out of the old ones, which they are now obliged to replace.

The hose business is about over, as regards garden hose, but some orders for fire hose are coming in. The call for fruit jar rings has been and still is lively. Strange as it may seem, when one considers the stories of prevailing industrial depression, the call for belting and packing is better than it has been for some months. Stories differ as to druggists' goods, and the same is true of rubber clothing, though some houses in the latter line have all they need to keep their factories going full time on orders. In the sole and heel business there seems to be an average of one or two new firms starting each week; and the curious part of it is, they all seem to get some business.

* * *

Speaking of rubber footwear, your correspondent was surprised to find in the small ad. columns of the daily papers an advertisement which reads as follows:

RUBBER BOOTS.

"About 400 pr second-hand rubber boots; Short, 75c, $1 and $1.50; Storm King, $1.25 and $1.75; Sporting, $1.50 and $2; Hip, $1.50, $2 and $2.50. Atlantic Marine Exchange, 14-16 Atlantic av."

There are plenty of second-hand shoe stores in the poorer sections of Boston, but it is doubtful if any one of them can furnish more than a single pair of second-hand rubber boots. Here, evidently, is an assortment, and enough to stock up a small store. Where did they come from? From the junk dealers, perhaps. Certainly the prices named are better than 6 cents a pound, the present quotation given by the dealers to collectors.

* * *

Your readers are all familiar with the munificent gift to Boston by President Forsyth of the Boston Belting Co.—the Forsyth Dental Infirmary—full illustrated account of which has been given in previous numbers of THE INDIA RUBBER WORLD. This institution is a beautiful building in the finest section of the city. I understand that the date for the opening of the infirmary has been definitely set for the first week in October, when it will begin its work with a capacity of over one thousand patients a week.

* * *

The entire assets of the Pilot Raincoat Co.—stock, tools, fixtures, machinery, etc.—were sold at auction on the 14th inst. for the benefit of the creditors.

* * *

Mention has been made in this journal of the growing scarcity of leather and the increase in the use of rubber, either alone or combined with other substances, to take its place in soles for footwear. At the Shoe & Leather Market Fair, however, there were shown other substitutes, which may, perhaps, replace rubber for that purpose. Rubber soles and heels were shown by several concerns, among them being: The Essex Rubber Co., of Trenton, New Jersey; The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin; The B. & R. Rubber Co., of North Brookfield; The Foster Rubber Co., Boston; The Empire Rubber & Tire Co., of Trenton; The O'Sullivan Rubber Co., New York; The Panther Rubber Co., Stoughton; The Plymouth Rubber Co., Canton.

Besides these manufacturers of rubber soles and heels there were exhibitors of various other products which contained rubber. The Vulcan Fibre Co. showed a sole which combined shredded leather with rubber, making a sole which it is claimed is proof against the slipping so objectionable in worn rubber soles on wet pavements. The Avon Sole Co. also exhibited soles of comminuted leather vulcanized with rubber.

The Revere Rubber Co. showed a new type of leather and rubber cut sole. It is called the "R. I. L," or Rubber Interlined Leather sole. It is really a rubber sandwich. The tread is of high grade sole leather. The part coming next the inner sole is of soft split leather, and between the two is an interlining of pure gum rubber. The whole is vulcanized together, making a unit which is likely to interest shoe manufacturers. The inventor, J. D. Prince, claims great flexibility, light weight, superior wear and waterproof qualities.

And a novelty—or nearly so—is the introduction of specially prepared felt soles, two concerns showing a solid, waterproofed felt, for which the claims are softness of tread, warmth and good wear.

But another sole was shown, by Kenworthy Brothers, which, while being of felt, nearer approaches in appearance the leather or rubber sole it is intended to supersede. It looks like rubber, but I am informed that no rubber is used in its construction. An examination would lead one to believe it was felt impregnated with some such preparation as that used in manufacturing linoleum or heavy oilcloth floor covering. This is claimed to outwear either leather or rubber for soling, and is practicable to place on the shoe either by hand or machine stitching.

So it is worth mentioning here that rubber soles may be superseded by something else, though the present outlook is that the demand will not be greatly lessened during the coming season.

* * *

While about it, it would be well to mention that the Revere Rubber Co. had as a base of its exhibit a great mat made of Spring Step rubber heels, thousands of them fastened together, making a solid carpet. The company offered a prize to the one who should guess the nearest to the number of heels in the mat. The number has not been given out. Possibly the mat may again be used for a similar competition. It is reported that its cost was more than one thousand dollars, each heel being perfect and including the red plug which forms a trade-mark of the company.

Changes in the capital stock of the Congress Shoe & Rubber Co. and the Pilgrim Rubber Co. are reported. These two companies, which are both selling rubber footwear made by the Hood Rubber Co., recently moved from adjacent premises on Atlantic avenue to adjoining and connecting stores on Summer street extension, while the management and officers of both companies were changed. Since then the Congress Shoe & Rubber Co. has authorized a reduction in capital from $100,000 to $5,000 by the cancellation of $45,000 of common stock in the hands of the treasurer and the surrender of authority to issue $50,000 preferred, none of which has ever been issued. The Pilgrim Shoe & Rubber Co., in contrast, has authorized an increase in capital stock by 500 shares of common.

* * *

I understand that the Fisk Rubber Co. has been most successful since its reorganization in 1912, and that its last year's gross business was nearly $12,000,000, about 50 per cent. better than its 1912 showing. It is now turning out nearly 3,000 tires per day, if reports in the daily press are accurate.

* * *

Ernest W. Graves, president, and Douglas N. Graves, treasurer of the United States & Mexico Banana Co., who have been accused of selling the assets of that company for $56,000 and failing to distribute this sum among the stockholders, are alleged to have been promoters of rubber plantation companies and fruit raising corporations, using the firm name of Graves & Graves, Inc., circularizing small investors in various sections of the country. The court was asked to restrain the defendants from disposing of the moneys or assets of the corporation, and to appoint a receiver, but when the case was called for trial, on July 15, the complainant, William L. Thompson, did not appear, an agreement to dismiss the suit having been reached.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

CONDITIONS in the rubber trade in this city are quite favorable in most lines, and particularly in tires and belting, the opinion being expressed by one of the leaders in the industry here that a new record has been made this year by the belting concerns of Chicago. The initial sales were heavy, and the requirements necessitated by the unusually large crops have increased the total to very satisfactory figures. One sale during the month by the W. H. Salisbury Co. to the Rock Island Elevator at Kansas City, Missouri—a repeat order—amounted to 2,500 feet of 22 and 30 inch belting.

The tire business in the middle west has shown a marked improvement during July, due to two causes—the improvement in country roads owing to the favorable weather and the increasing popularity of extended motor trips.

Another line in which sales are expected to materially improve in the near future is in railroad supplies. In an exclusive interview with your correspondent, Mr. J. H. Anderson, of the local branch of The B. F. Goodrich Co., had the following to say on this subject:

"If the request of the carriers for an increased freight rate is granted, as I understand it will be within a few weeks at the latest, there will be some phenomenal purchases of air-brake hose, bell cord and other rubber products used by the railroads. I have reason to believe that the stocks of most of the railroads are low. They have been following a policy of retrenchment, owing, I think, to a certain resentment over the delay in granting them the increase they want. Now I believe that if the increase in freight rates is given to the railroads in the near future they will at once change their policy, and not only proceed to push business in all directions but pass out the word to their purchasing departments to load up at once. Most of the western railroads buy their entire supply of rubber equipment in Chicago, and many of the eastern roads also come here for similar supplies. The total figures last year in rubber supplies purchased by the railroads of the country reached $8,000,000, evidence that the railroads are no mean customers."

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

OWING to the close relationship of the affairs of the Consumers Rubber Co., of Bristol, the Atlantic National Bank of this city and the Walpole Tire & Rubber Co., all of which are in receivers' hands, the outcome of the settling of the affairs of the latter's concern is being watched with more than usual interest in this vicinity. The auction sale of the plant of the Walpole company, which on June 1 was postponed to July 8, because the upset price of $1,500,000 was not reached, on the latter date was again postponed until August 12. Curtis G. Metzler, representing the reorganization committee of the stockholders, stated to the court that his committee had come to a partial agreement with the creditors' committee that inasmuch as the masters had not found, with respect to some $300,000 of claims, as to whether they should be allowed or disallowed; and with plans pending whereby the reorganization committee shall bid in the plant, the postponement was agreed to.

* * *

The new plant of the Phillips Insulated Wire Co., in Pawtucket, will, when completed, be a model of its kind. The specifications have been completed and the old plant will be connected with the new, across Freeman street, by tunnels. The maximum dimensions of the new mill building will be 200 x 200 feet, three stories and basement. The lower floors of the mill will be of exceedingly heavy construction, the two upper floors being of ordinary strength. Steel floor beams and cast iron columns will be used throughout. The mill tower will contain a 30,000 gallon tank to serve a complete system of automatic sprinklers. The new power house and mill are to be connected with each other and with the present plant by an overhead bridge and three underground tunnels.

The power house will be about 100 feet long, 60 feet wide and 40 feet high. It will be equipped with two 600 kilowatt, 550 volt, three-phase 60-cylinder turbo-generators, made by the General Electric Co. The generators will operate, condensing by means of a surface condenser made by the Wheeler Condenser & Engineering Co., using an Edwards air pump and a turbine-driven centrifugal pump made by the De Laval Co. The Barnard cooling tower will be 65 feet high, and will be operated by two fans 10 feet in diameter running at 220 revolutions per minute. Steam will be furnished by eight 90-inch Manning boilers having a total capacity of 2,400 boiler horse power. The coal for the boilers will be stored in an underground coal pocket adjoining the entire length and end of the power house for a distance of 170 feet. The chimney will be of red radial brick, 175 feet high and 7 feet internal diameter, and will have lightning rods and exterior ladder. The power house will be equipped with "fenestra" steel sash, wire glass and copper doors and will be entirely fireproof throughout. An artesian well, 700 feet deep, will furnish a supply of 200,000 gallons of water daily.

* * *

Colonel Samuel P. Colt, president of the United States Rubber Co., sailed on July 1 from New York on the "Aquitania" for several weeks' absence in Europe. He was accompanied by Colonel Harold J. Gross of this city and wife, the latter being Colonel Colt's niece. They will spend most of their time in London and Paris, motoring in France and England. The daily paper published on board the Cunard liner printed an interesting account of the celebration of Fourth of July on that steamer, in which Colonel Colt was credited with playing a prominent part, officiating as chairman of the day and toastmaster at the dinner in the evening.

Large shipments of rubber shoes were made the early part of July from the factory of the National India Rubber Co., at Bristol, the goods being consigned to the far West and the Southwest.

At this factory a new system of endless chain conveyors has recently been installed on the front end of the buildings, for the better manipulation of the material in process of manufacture at the plant.

Information has been received at Bristol that William McCaw, former paymaster and assistant treasurer of the National company, has been elected assistant treasurer of the Lee Tire & Rubber Co., of Conshohocken, Pennsylvania, of which John J. Watson, former treasurer of the United States Rubber Co., and formerly a resident of Providence, is vice president. Mr. McCaw has been connected with the company only a short time, going there as office manager, his family not having yet been removed from Bristol.

* * *

The steel stack at the plant of the Revere Rubber Co., on Valley street, this city, has been completed. It was erected in four sections, the base setting upon a steel-supported foundation 30 feet in height. The first two sections of the stack are 35 feet in length and the other two are 30 feet each. The entire stack is 130 feet in height, 7½ feet in diameter and weighs approximately 23 tons. It is attached to the new power plant of the company.

Greeted by a large motor truck filled with the superintendents and heads of departments at the local plant of the Revere Rubber Co., Mr. and Mrs. Arthur H. Carr arrived here June 26 following a honeymoon of about two months in Europe. Mr. Carr is superintendent of the rubber thread department of the plant and was sent to Europe to observe methods in use there and to obtain certain stock which was needed at the plant. Before going away, however, he stole a march on his fellow workers by getting married without announcing the fact to them. This was the reason for the demonstration upon their return home.

The plant of the Revere company, at Atwell's avenue and Valley street, this city, was closed June 26 for the purpose of taking the annual account of stock. The gates reopened July 6 with the prospect of the plant being operated to its fullest capacity and the possibility of having to run overtime in the near future.

* * *

The Perfection Rubber Co., with a capital stock of $100,000, has filed articles of incorporation with the Secretary of State of Rhode Island. It is to be located in this city and manufacture a patented device known as "The Perfection Sanitary Belt." The incorporators are John B. Desrosiers, Eldrege Desrosiers and John T. Bannon.

* * *

Contracts for supplying rubber coats, rubber boots and fire hose for the several fire companies of Bristol were recently awarded by the town council. Charles V. Perry, of Bristol, will supply the boots at $2.80 a pair; Frank M. Dimond, of Bristol, the rubber coats at $3.95; the Cornelius Callahan Co., of Boston, 500 feet C. C. C. fire hose, at 70 cents; Combination Ladder Co., Providence, 500 feet wax-treated hose, at 70 cents; Eureka Fire Hose Co., 400 feet, at 65 cents—all to be single jacket hose.

* * *

The Bourn Rubber Co. has decided not to rebuild its factory on Westfield street, this city, that was burned down a couple of months ago, and which contained the wire department. A large building on Westfield street, only a short distance from the Bourn plant, has been temporarily leased by the company and has been equipped to do the work formerly done in the burned building. About 80 per cent. of the capacity of the old shop is the output of the new quarters to start with, and this is more than double the amount of wire that was being turned out at the time of the fire.

* * *

George R. Stamford, Fall River, has filed suit in the Superior Court in this city against the Cataract Rubber Co., of Providence, for the sum of $8,000 for alleged breach of contract. The plaintiff claims that he entered into an agreement with the defendant company to sell shares of the capital stock of the concern. He claims he made several sales, the commission for which is still due and that he was discharged without notice on February 1, 1913.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE preliminary schedule filed by the State Board of Assessors shows the tax against 8,371 miscellaneous corporations of the State for the year to amount to $2,544,943. Among the corporations which will pay taxes upon an outstanding capital of $50,000,000 or over are the American Steel & Wire Co., manufacturers of rubber insulated and other wires, with a capital stock of $90,000,000, and the United States Rubber Co., with a capital of $95,693,700.

The report for the year ending May 31 shows that the State Department of Motor Vehicles has received in 1914 for automobile, motorcycle and drivers' licenses $106,133 more than the total similar receipts for the previous year, the total collection for 1914 amounting to $600,335, and for 1913 to $494,202.

* * *

The United & Globe Rubber Manufacturing Cos., of this city, are reported to have passed a resolution for a $50,000 increase in capitalization, this new financing to be employed in the erection and equipment of a tire manufacturing plant.

E. H. Openshaw, who has been assistant general manager of the United & Globe companies, has resigned this position and gone to Chicago to join his wife, who is visiting in that city, and will later spend some time in traveling, having as yet made no definite plans for the future. Before leaving the city he was presented with a handsome twenty-four piece set of cut glass by the employes of the company, as a token of their appreciation and esteem.

* * *

A number of the employes of the Empire Rubber & Tire Co. spent July 3 at Pleasure Bay and nearby coast resorts, going down by automobile early in the morning and returning late in the evening of the same day.

* * *

Edgar M. Church has been appointed sales manager and secretary of the Howard Demountable Rim Co. and will hereafter divide his time between the Philadelphia and Trenton offices of that company, being in the former city until 1 P. M. on Mondays, Wednesdays and Fridays.

* * *

The Red Letter Tire Co. has been formed at Columbus, Ohio, with offices at 20 East Town street, to act as local distributors of Acme Red Letter tires and tubes, the product of the Acme Rubber Manufacturing Co., of Trenton. Leo E. Sulzer is manager of the new company.

* * *

The timely and effective use of garden hose was instrumental in saving to the people of Morrisville, New Jersey, the Baptist church of that town, which caught fire on the night of July 4 from fireworks dropped on the roof. A nearby resident discovered the blaze and neighbors responding to the alarm with their garden hose extinguished the fire before the arrival of the fire department.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

THE Savage Tire Co., of San Diego, is about to establish a branch distributing house at San Francisco, California. It will be recalled that in the July number of THE INDIA RUBBER WORLD mention was made of the holding up of a large shipment of rubber and materials belonging to the Savage company through the seizure by the Federals of a section of Mexican railroad. These supplies have since been received in good condition, but the delay occasioned no curtailment of production, for the company, in anticipation of such an event, had telegraphed their Eastern agents to duplicate the shipment, which they did, by fast freight, thus keeping intact the large reserve stock of rubber and other materials constantly maintained at the Savage factory.

* * *

Mr. L. C. Miles, formerly associated with the rubber industry at Akron, Ohio, died of apoplexy on June 26 at the Agnew Hospital in San Diego. He was 56 years old and had removed to that city five years ago.

R. V. Terry has been appointed manager of the San Diego sales branch of the Republic Rubber Co., of Youngstown, located at 1070 Third street.

Charles R. Sargent has joined the sales force of the Goodyear Tire & Rubber Co., at San Francisco.

R. L. Sergeant, local sales manager of the Fisk Rubber Co., of Chicopee Falls, Massachusetts, and L. M. Jones, northern representative, have recently returned from a seven-day automobile trip through northern California and southern Oregon.

* * *

An association comprising an initial membership of sixty tire men was formed at Oakland, California, on July 9. Among the officers elected at the meeting on that date were A. L. Dexter, of the Fisk Rubber Co., vice-chairman, and W. L. Little, a Diamond tire dealer, secretary, while the installation ceremonies were conducted by "Bob" Maitland, a Pennsylvania tire man.

* * *

A new distributing agency for Kelly-Springfield tires has been established in Oakland, California, through the opening of the Oakland Speedometer Service Station Co. by L. G. Reno, well known to the trade of that section on account of his previous connection with the Stewart-Warner Co.

* * *

The W. D. Newerf Rubber Co., of Los Angeles, which is to distribute the entire product of the Panama Rubber Co., of Compton, California, is understood to be at present arranging for the establishment of agencies through the Imperial Valley.

A natural advantage enjoyed by the Panama company in the production of its tires is the possession in connection with the plant of an artesian well, worth to the company thousands of dollars annually in supplying the large volume of water used in tire manufacture. This well is capable of supplying 81 miners' inches of water through a 12-inch pipe, the pressure being sufficient to throw a 6-inch stream 100 feet high. Its value as an asset is placed at $50,000.

LIEUT.-COL. ARTHUR F. TOWNSEND.

THE news that Colonel A. F. Townsend has departed for a tropical trip—this time to the rubber planting sections of the Middle East—will not come as a surprise to those who know him. They will quickly recall his many trips to Central America and the West Indies, as well as his rapid journeys through the United States and Europe. For such a live, energetic, wide-awake personage to be caught napping is, to say the least, unusual; yet the proof is produced in the accompanying illustration made from a photograph taken by the editor of THE INDIA RUBBER WORLD off the coast of Nicaragua. Speaking of that boisterous little republic, it will be remembered that Colonel Townsend some years ago established a fine rubber plantation there. As an adjunct to it he formed a trading company. Then when, for the first time in a century, a hurricane blew the rubber trees away, he sold the land and the trading company, and gave back to the stockholders their original investments. Then he started a plantation in the Middle East, of *Hevea*, and that is what he is at present visiting.

THE COLONEL CAUGHT NAPPING.

A Boston Latin School boy, and later a student in the Massachusetts Institute of Technology, he began his rubber career with the New York Belting & Packing Co. in 1884, first at the factory, and later at the New York office. His energy and ability carried him rapidly to the front in that important organization. In 1896 he resigned his position, and together with Mr. Frank Cazenove Jones and others formed the Manhattan Rubber Manufacturing Co., of which he became vice-president. In 1902, on the resignation of Mr. Jones, Colonel Townsend was elected president, and it is largely owing to his wise and energetic direction that the company now holds its enviable position in the rubber trade.

Besides being successful as a business man, Colonel Townsend is prominent in military affairs. He served for several years in the Seventh Regiment of New York, and later joined Squadron A, one of the most famous bodies of troopers in the country. He found the association extremely congenial, and it was not long before he was elected captain of one of the troops. In this position he displayed abilities which soon took him out of Squadron A, and made him Quarter Master General of the State of New York, with the rank of Lieutenant Colonel, which position he now holds.

Colonel Townsend traveled East via the Pacific with Mr. H. U. True, of The Manhattan's Boston agency. They are making a fast trip as far as Singapore, and from there expect to visit Java and inspect the Manhattan plantation. From Singapore they will continue on via Ceylon to England, and thence home.

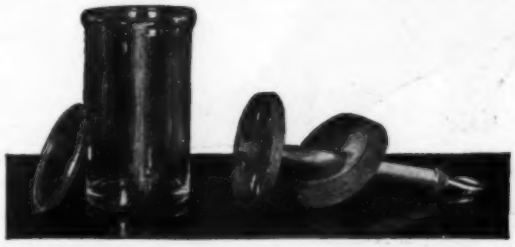
Mr. E. F. McGovern of the Stoughton Rubber Co., Boston, left for Europe on July 9 by the "Carpathia" of the Cunard Line. During his trip through Great Britain and the Continent he will make a careful study of raincoats. He expects to return the latter part of August.

New Rubber Goods in the Market.

THE AIR-SEALED VACUUM JAR.

A RECENT invention bids fair to radically change the canning industry and particularly home methods of preserving fruit.

The illustration shows the glass jar and cover, which are of novel form, and the simple pump used for creating a vacuum. The cover fits snugly and evenly on the top of the jar and is provided with a narrow rubber jar ring. It is also notched so that the vacuum can be destroyed by inserting the point of a pin when it is desired to open the jar. The pump is held

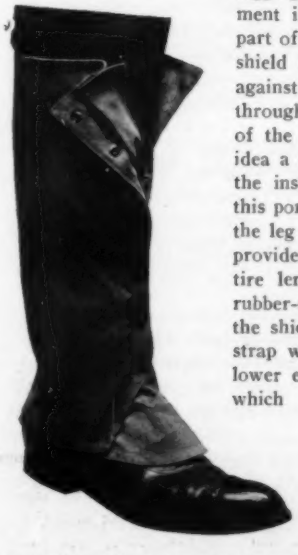


firmly to the top of the jar by a round rubber cap. The flanged end of the pump fits the glass cover, which acts as a check valve.

In preserving fruit it is only necessary to boil it for the purpose of sterilizing it. The fruit is then put in the jar and covered with its syrup. After the glass cover is placed on and the pump attached to the top of the jar by means of the rubber cap, a few hand strokes of the pump will create a vacuum and hermetically seal it. When it is desired to open a jar a pin is inserted between the rubber ring and the side of the cover and the air finds an entry, the cover becoming automatically detached. A portion of the contents can be taken from the jar and the cover replaced, and the jar again sealed by a few strokes of the pump. [The Stoltz Appliances Corp., 220 West Forty-second street, New York.]

A NEW WATERPROOF LEGGING.

A patent has recently been granted to W. E. Woodward, of Malden, Massachusetts, on a new and useful improvement in leggings. The object of this improvement is not only to protect the lower part of the leg and the ankle but also to shield the upper portion of the foot against the access of rain and snow through the laced or buttoned opening of the shoe; and in carrying out this idea a flap or shield shaped to fit over the instep has been provided to cover this portion of the foot, connecting with the leg portion of the legging, which is provided with a tongue extending its entire length. The legging is made of rubber-coated waterproof material, and the shield is held in place by a leather strap which is also connected with the lower extremity of the leg portion and which passes under the foot. One feature of the legging is its ease of adjustment, as it opens in front instead of on the side as is the case with the ordinary legging, and another is the fact that it can be folded and slipped into the pocket or bag when not in use, occupying only a very small space. [Patent No. 13,747.]



A JAW BRACE OF RUBBER.

Here is a jaw brace designed for use in administering anesthetics in dental work, and in surgical work in the mouth and throat, and of such a nature as to add nothing to the discomfort of the patient. This device is made of flexible rubber, and conforms to any mouth. In adjusting it the ends are brought together between the thumb and finger, and the brace is placed in one side of the mouth parallel with the back teeth, and with the ends to the front. No precaution is needed against the brace slipping down the throat, for when released it will spring out of the month. Among its distinctive advantages is the fact that it occupies only a very small space, leaving more room for the operator. [Dr. A. R. De Pass, Columbia, South Carolina.]

"UNEEK" RUBBER CURTAIN SUPPORTS.

The uses to which rubber may be put in the home are already numerous and varied, but a new one has been devised which is likely to be much appreciated. This is a stout rubber cord for use in hanging curtains, and it has many advantages over the old style brass rod which became unsightly after slight use,

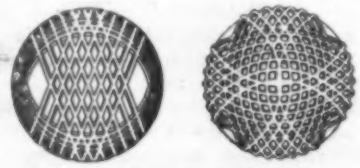
and was liable to soil the curtains. The cord is finished with metal ends, and metal pieces are also supplied for attachment to the window frame, the cord, after it has been run through the curtain, slipping into these frame pieces. These elastic supports are quite inexpensive, costing only 10 cents complete per window, are neat in appearance and cannot be broken by rough or careless usage. [Fair Novelty Manufacturing Co., 10 East Fourteenth Street, New York.]

WINGFOOT RUBBER HEELS.

The essential feature of this device is shown in the accompanying illustration. The air cushions give added resiliency and the "safety cups" reduce to a minimum the chance of slipping because the heel has worn smooth. They are made of red and black rubber for every size and style of shoe. The makers think that the "Wingfoot" is the last word in rubber heels and claim for it "the real cushion tread sought for years," absolute safety and "greater-than-leather" wearing quality. [Goodyear Tire and Rubber Co., Akron, Ohio.]

DESIGN FOR A GOLF BALL.

The accompanying drawing shows a new golf ball, the subject of design patent No. 45,741, filed by B. De Mattia, of Garfield, and assigned to the F. A. Cigol Rubber Co., of Paterson—both in New Jersey. The ball is made with four series of circular ridges extending around it in four directions and interlacing, as shown.



A NEW GOLF BALL DESIGN.

A NEW RUBBER FOOT.

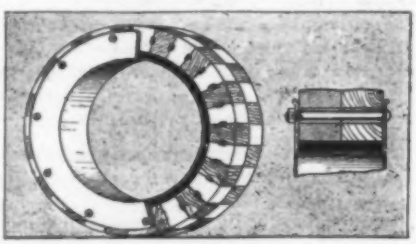
We illustrate herewith an artificial foot made of rubber and steel springs, recently patented in England by B. Graham, of Belfast, Ireland. The entire lower portion of the foot, extending from the heel to the toe, is made of rubber. This part is indicated at *a*. The sole part has flexible steel plates imbedded therein and held together by means of clips. In the heel portion are flexible coil springs to assist in supporting the rubber cushion.

A NEW USE FOR ELASTIC FABRICS.

The insistent demand for a corset which while giving natural and graceful lines will at the same time furnish the desired support, has led to the production of a great variety of elastic corsets, many of which, however, have been found unsatisfactory on account of their tendency to stretch and bulge in spots after a few wearings. This defect, according to the makers, has been completely overcome in the manufacture of the "Smart Set" corset, which is made not altogether of elastic but of "Lastikops" cloth, an open, ventilated weave with interwoven elastic sections, said to be light and cool; to give but not to stretch; which doesn't heat or draw, and which wears like a strong coutil." [Smart Set Corset Co., New York.]

A WOOD AND RUBBER BLOCK TIRE.

The accompanying drawing shows a novel form of motor truck tire, built up of alternate blocks of wood and rubber. The rim is L-shaped, and has a detachable flange bolted to one side in order to complete the annular trough which receives the tire. A solid rubber ring is provided in the bottom of the trough, as shown in the sectional view, and the blocks are seated upon this. There are two staggered rows of the wood and rubber blocks, which are retained in position by wooden pegs fitting in elliptical slots between them. At certain points the bolts, which hold the side plates together, take the place of the wooden pegs. It is said that this construction provides a tire possessing resiliency and good wearing qualities. The tendency to skid is reduced, and the tread surface is easily renewed when worn down.



This tire is the subject of British patent No. 16,234, recently granted to S. T. Richardson and R. Price.

A WOMEN'S RUBBERIZED VELVET TOP SHOE.

Here is something really new in footwear for women. Apparently it is a nine-button shoe with patent leather vamp and velvet top, but as a matter of fact it is not a button shoe at all as the velvet top has an elastic back similar to the goring of the congress shoe of former days and the wearer has only to pull the shoe on and pull the shoe off without touching a button. This not only saves all the time of buttoning and unbuttoning, but, what is more to the point, the shoe fits just as snugly after being worn a month as it does on the first day. This shoe is made both in high top and low cut style and in lace as well as in button effect. It is being introduced by Lord & Taylor, of New York, and its convenience and trimness should give it immediate popularity.

A LIVE LEATHER AND RUBBER BELT.

A decided novelty in the way of a belt for men is made of many long parallel strands of rubber thread laid loosely on each side of an inner fabric strip or base. The cover, which is of leather, is soaked until pliable and then stretched and grained to imitate various leather finishes. The edges are skived, and the cover is then cemented over the rubber thread and fabric base. When finished it presents an attractive appearance, and is agreeably flexible to the wearer. [The Live Leather Belt Co., 78 Walker street, New York.]

ALL CROOKED LEGS MAY NOW BE STRAIGHT.

There is nothing that takes the ardor and ambition out of a man and plunges him into chronic "dumps" like coming into the world with a pair of bow legs. A man may have the heart of a lion and be able to speak six languages but if he has bow legs everybody laughs the minute he comes in sight. But fortunately bow legs are now a thing of the past. Here is the "bow-strait," a simple Pennsylvania invention which puts straight legs and crooked legs all on a par. It is simply a bow of pliable hard rubber fastened at both ends to the garter, the bow projecting out from below the knee towards the other leg. Obviously, the trouser hanging down over this rubber projection is obliged to hang straight, so that the bowest-legged man can carry himself with dignity, and nobody know the difference, unless he is one of those people who can't keep a secret and tells it himself. (Cavanagh Bros., Pottsville, Pa.)

THE BOWSTRAIT—A DEVICE FOR PERPENDICULARIZING BOW LEGS.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

News of the American Rubber Trade.

THE MINER CONVENTION AT GRANBY.

FROM all parts of Canada, a goodly company of about fifty selling agents, representatives and branch managers of the Miner Rubber Co., Limited, Granby, Quebec, gathered on June 25 and 26 at the headquarters of the company. Such assemblages are valuable adjuncts to the efficiency of the staff, by the introduction of the personal element. Each member of the party was made to feel at home, owing to the welcome extended by W. H. Miner, vice-president and the other officials, prominent among whom were R. R. Macaulay, secretary-treasurer, and F. H. Meinzer.

The two-hour journey from Montreal on June 25, was made in a special Pullman car, attached to the 9:10 a. m. express; placing the visitors in the best possible shape to enjoy the two days' program ahead of them. After an excellent luncheon, the sales agents and branch managers had private interviews with the management; while the rest of the company were free to dispose of their afternoon in getting acquainted with the picturesque town of Granby.

Next morning was devoted to inspecting the finely equipped plant of the company, commencing with the box and carton department. In the power-plant, which was next visited, the visitors had an opportunity of seeing the automatic underfeed stokers, used only when the water power is insufficient—which is seldom. After taking in various accessory departments, the party were conducted through the crude rubber storeroom down into the calendering room, with its huge rolls through which the various materials pass. One of the special features of the works is the curing apparatus on the ground floor.

Another noteworthy feature is constituted by the facilities existing for loading and shipping, as well as for receiving coal and other supplies.

After a general business session in the afternoon, the party sat down in the evening to a sumptuous banquet, after which they returned to Montreal, highly pleased with the reception accorded them by the company.

Selling Agents, Representatives and Branch Managers of the Miner Rubber Co., Limited.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

CAPITALIZATION CHANGES.

The authorized capital stock of the Revere Rubber Co., of Revere, Massachusetts, has been increased from $4,000,000 to $5,000,000.

The capital stock of the Thermoid Rubber Co., of Trenton, New Jersey, has been increased from $300,000 to $750,000. By the amended charter, filed in the County Clerk's office on July 2, the stock of this company is divided into 7,500 shares, of which 6,000 are common and the remaining 1,500 preferred.

The capitalization of the Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio, has been increased from $100,000 to $500,000, and plans are under way for the erection of new factory additions which will enable the company also to greatly increase its production. These will be started as early as possible and will probably be of brick and adjoin the present factory.

The capital stock of the Arrow Rubber Co., of Boston, has been reduced from $25,000 to $5,000.

The capital stock of the General Rubber Co., a subsidiary of the United States Rubber Co., has been increased from $5,000,000 to $8,000,000.

RUBBER COMPANY DIVIDENDS.

The Lee Tire & Rubber Co., of Conshohocken, Pennsylvania, paid on July 10 a regular quarterly dividend of 1¾ per cent.

The Swinehart Tire & Rubber Co., of Akron, Ohio, paid on July 15 a dividend of 1½ per cent.

The Killingly Manufacturing Co., a subsidiary of the Goodyear Tire & Rubber Co., of Akron, Ohio, has declared a semi-annual dividend of 3 per cent. on its preferred stock.

The Hood Rubber Co., of Boston, has declared a regular quarterly dividend of 1¾ per cent. on its preferred stock, payable August 1 to stock of record on July 28.

The Canadian Consolidated Rubber Co., Ltd., of Montreal, has declared a regular quarterly dividend of 1¾ per cent. on its preferred stock and a dividend of 1 per cent. on its common stock.

The B. F. Goodrich Co., of Akron, has declared a dividend of 1¾ per cent. on the preferred capital stock of the company, payable October 1 to stockholders of record on September 18.

THE NEW MULCONROY FACTORY.

The Mulconroy Co., of Philadelphia, has recently erected a new factory at Fifty-fourth and Jefferson streets in that city for the manufacture of its specialties, including its flexible

PLANT OF THE MULCONROY CO., PHILADELPHIA.

metallic hose, couplings, nipples and "7-League" rubber boots with sewed on leather soles. This illustration gives a very good idea of the new factory.

THE WADLEIGH CO., LTD., OF SINGAPORE.

The January number of THE INDIA RUBBER WORLD contained a brief story covering the plans of Mr. W. L. Wadleigh, formerly of Boston, who was about to start at that time for Singapore, where he hoped to make connections by which he could act as representative in New York of the eastern planters and sell their rubber direct to American manufacturers. He sailed for Singapore early in January, arriving there about the middle of February, and he has now returned to this country after having successfully accomplished all that he planned to do. He has established a company at 4 Robinson Road, Singapore, under the name of Wadleigh Co., Ltd., and has also become associated with Dunbar & Co., at 290 Broadway, New York. Through these two connections he will buy rubber from the planters for direct shipment to New York or will act as a commission merchant to sell their rubber to the American manufacturer.

As mentioned in some detail in the January issue, Mr. Wadleigh has had twenty-five years' experience as a commission merchant (chiefly in Boston) and is well acquainted not only with all the large buyers of rubber in the United States but with the requirements generally of the manufacturing trade.

MR. T. W. MILLER HAS AN AUTO. ACCIDENT.

Mr. Thomas W. Miller, president of the Faultless Rubber Co., of Ashland, Ohio, while on his way with a party of friends in an auto, recently, for a short vacation at Mount Clemens, Michigan, met with a painful accident. As the car was going through a tunnel under the railroad track at Chicago Junction it skidded on the pavement where a quantity of oil had dripped from the engines above and struck the curb with such force as to overturn it. Mr. Miller's collar bone was broken and some of the ligaments at the shoulder were painfully torn. It is not expected, however, that the accident will result in any permanent injury.

RUBBER MILLS CLOSE DOWN FOR SUMMER REPAIRS.

The factory of the Candee Rubber Co., at New Haven, closed on July 18 for the customary midsummer machinery repairs. The factory expects to open again on August 10.

The factories of the Boston Rubber Shoe Co., at Essex Fells and Edgeworth, Massachusetts, closed on July 25 for annual summer stock taking. Both of these mills will also re-open on August 10.

SALE OF THE WALPOLE COMPANY AGAIN POSTPONED.

The sale of property of the Walpole Tire & Rubber Co., at Walpole, Massachusetts, scheduled for July 8, has again been postponed until August 12. The postponement was due to an arrangement between the reorganization and the stockholders' committees, the representative of the latter committee informing the court that a plan was on foot whereby the committee would buy in the property, thus protecting both the creditors and the stockholders.

The receivers of the Walpole company have recently filed their second report, which shows aggregate sales for the first five months of the present year to have amounted to $708,486, on which the profits were $112,359 gross, $83,801 net. This report shows the surplus of the Walpole Rubber Co., Ltd., of Granby, Quebec, to be $27,323, the assets of that company amounting to $406,442, and places the surplus of the Walpole Shoe Supply Co., whose assets are given as $342,074, at $34,688.

TRADE NEWS NOTES.

The Farrel Foundry & Machine Co., of Ansonia, Connecticut, manufacturers of rubber mill machinery, is planning an addition to its plant.

While alterations are in progress at the plant of the Sterling Gum Co., in Long Island City, New York, the headquarters of the company will be located in Greenpoint, Brooklyn, where a large factory building has been leased for this purpose. The additions and alterations planned will increase the capacity of the plant to about five times its present output.

The name of the Detroit Pneumatic Tire Co. has been changed to the Wilson Tire & Rubber Co.

The contract for pneumatic tires and tubes to be used on motor vehicles operated by the Highway Department of the State of Pennsylvania has been awarded to the Pennsylvania Rubber Co., of Jeannette, while the contract for solid tires for use in the same department has been placed with the Gibney Tire & Rubber Co., of Conshohocken.

The officers of the S. & M. Tire & Rubber Co., of Coshocton, Ohio, and the members of the Board of Trade of that city, are reported to have reached an agreement whereby the company becomes the property of the local stockholders. The plant of this company is now completed and most of the machinery installed, but operations have been delayed owing to difficulties in financing.

Work has been started on a new factory building 220x50 feet in area for occupancy by the McNaull Auto Tire Co., at Toledo, Ohio.

The King Rubber Co., incorporated March 31 last under the laws of Massachusetts with a capital stock of $50,000, to manufacture articles made wholly or in part of rubber, gutta percha, etc., has leased the extensive manufacturing property, fully equipped with rubber machinery, owned by the Hyde Park Rubber Co. and located at 915 Hyde Park avenue, Clarendon Hills, a suburb of Boston. This plant is being remodeled for immediate occupancy.

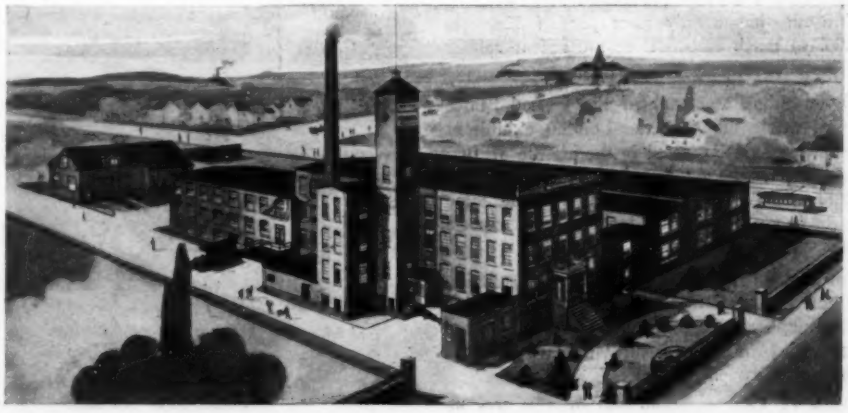
The Cambridge Rubber Co., of Cambridge, Massachusetts, has been petitioned into bankruptcy at the instance of three creditors, the largest of whose claims amounts to $11,500, and represents two promissory notes.

A receiver was appointed on July 8 for the Oxford Rubber Co., of Cambridge, Massachusetts, on the petition of Isaac McPherson, of Bridgeton, New Jersey, surety on a contested note for $4,100 held by the Cumberland National Bank of Bridgeton. The assets of the Oxford company are said to be in excess of its liabilities, which are estimated at $48,000.

The best of rubber bands can be made by cutting up discarded inner tubes of tires.

THE NEW YORK MACKINTOSH CO. TO MAKE DRUGGISTS' SUNDRIES.

The New York Mackintosh Co., with main office and factory at Mamaroneck, New York, and salesrooms at 39-41 West 32nd street, New York City, and in the Lytton Building, Chicago, was founded fifteen years ago by Charles A. Place, formerly president of the Metropolitan Rubber Co., and vice-president of the New York Insulated Wire Co. After Mr. Place severed his connection with the above mentioned companies, he started the New York Mackintosh Co. at 114-116 Bleecker street, New York City, in a small way. The business has grown in the past fifteen years so that the company's plant now comprises over 75,000 square feet of floor space.



PLANT OF NEW YORK MACKINTOSH CO., MAMARONECK.

The plant is equipped for the manufacture of waterproof clothing from the raw material to the finished article. One building is devoted to spreading and calendering, and mill work, and the company has just erected a new building, 50x100, two stories high, for the manufacture of druggists' sundries. All the guaranteed products of the New York Mackintosh Co. are put out under the "Bestyette" trademark, which enjoys an enviable reputation in waterproof clothing circles. The druggists' sundries will be advertised under the same brand name.

DESTRUCTION OF THE MEXICAN CRUDE RUBBER CO. PLANT.

Probably our readers will recall the account which appeared in the June number of THE INDIA RUBBER WORLD of the destruction on May 15 of the above plant at Detroit, Michigan, but only recently the report of the coroner's investigations and other data at hand allow a surmise as to the cause of the explosion, which was most severe, and resulted in the loss of life of ten operatives, and the serious injury of six more, out of a total of 27 chemists and operators.

It will be remembered by many that several years ago this company was formed from several mining and land interests in Mexico, and supplied a large quantity of guayule to the American market under the trade mark or brand of "Viesca." It had two guayule plants at Viesca, Mexico, and one at Cadral. Its main offices are at Detroit, and during the time it was active as a rubber producer R. M. Dyar was its president and W. E. Parker its general manager. It appears that the Detroit plant was not at the time of the disaster employed in any way in rubber work, but in the manufacture of artificial leather, using the nitro-cellulose coating process.

The most astonishing thing about the disaster was the testimony of the manager at the coroner's inquest, to the effect that he did not know that nitro-cellulose was explosive. It is evident that in these days of complicated manufacturing processes it becomes necessary to conduct operations under the direction of real experts who are educated for the work and who know the character of the materials they handle. The probability is that the explosion was caused by the ignition of the volatile solvents, which in turn detonated the nitro-cellulose. The explosion tore the fine, isolated steel and concrete building to pieces.

LIQUID CORE GOLF BALL.

A company that has been quite successful in making golf balls in the United States, which advertises itself as making "the only Liquid Golf Balls on the American Continent," is reported to have been sued by a caddy for injury to his eye through the bursting of one of the company's balls. According to common report the ball was filled with acid. This did not seem reasonable, therefore one of the staff of THE INDIA RUBBER WORLD, who is a chemist, took occasion to purchase a ball and discover its fluid contents. There was no acid, but, on the other hand, it wasn't pure water. The report of the chemist, briefly, is:

"I find it to weigh 42.120 grams (1½ ounces). On boring into it I obtained 1.3 c. c. of liquid, which weighed about 2.34 grams, giving a specific gravity of 1.8. The liquid was a concentrated solution of zinc chloride, with no sulphate. It was in a solution of about 65 per cent. zinc chloride. Owing to the small quantity of liquor the results are not as reliable as might be obtained under better conditions, but this is approximately correct. The zinc chloride was slightly alkaline to methyl orange, though strongly acid to phenol phtalein. This means that there was a slight amount of zinc oxide dissolved in the chloride. The specific gravity of the whole ball was 1.023. The liquid was about 5.5 per cent. of the total weight of ball. On cutting the ball with a saw, when it was about half cut it sprung open and a mass of rubber bands under high tension was exposed, and an inside ball formed of a large number of laminated sheets sprang out. The outside of the ball was painted red, and had a rough surface. Beneath this was a thin, tough, white skin; then about 1/16 inch of a black rubber casing; after which came the rubber bands or strings, and the inside ball was about one-half the diameter of the outside. It is possible that the liquor was held in the inside ball in the laminated films and did not touch the outside bands, but they were wet when I opened the ball, though this might have been due to the wall being bored into."

In justice to the manufacturer it is only fair to say that all they were trying to do was to make one of the most resilient balls possible; that it was an exceedingly good ball, and that accidents, if they did occur, were rare events. The report is that this type of ball has been withdrawn from the market.

MILLER RUBBER CO.'S NEW STOCK ISSUE.

The Miller Rubber Co., of Akron, has recently issued new 7 per cent. cumulative preferred stock to the amount of $500,000, of which $400,000 is said to have been purchased by brokers in Cleveland, this being the total amount of preferred stock outstanding. The common stock outstanding amounts to $1,000,000. The new issue is redeemable at 120, and restrictions are provided that no mortgage or other lien nor any new issue with prior or equal rights shall be effected without the consent of 80 per cent. of the outstanding preferred stock; while a sinking fund provides for the retiring of $25,000 par value annually. The total tangible assets of the company, after deducting all debts, are said to be $1,654,000.

PERSONAL MENTION.

Mr. Henry C. Pearson, editor of THE INDIA RUBBER WORLD, has sailed for the Far East, to attend the Rubber Congress to be held at Batavia, Java, next month. This meeting of eminent rubber scientists and experts will result in much interesting and important information for those interested in plantation rubber.

Mr. J. C. Brady, a director in the United States Rubber Co., has been elected a director in the United States Cast Iron Pipe & Foundry Co., to succeed his father, the late Anthony N. Brady.

Mr. George Watkinson, that sturdy purveyor of Emarex, whose exhibit attracted so much attention at the recent rubber exhibition, sailed for New York, July 11.

Mr. Clarence H. Loewenthal, secretary of the United States Rubber Reclaiming Co., whose stand at the London exhibition was the centre of so much interest, started in the middle of July for a tour of Switzerland with the avowed object of doing some mountain climbing, and Mr. L. D. Plum, chemist of the same company, is making a business tour of the Continent and expects to return to New York about September 1.

Mr. Frank Venn, of Malden, Massachusetts, has been touring the Provinces and is now on the Continent in the interest of his rubber boot and shoe numbering machines, so generally used in America and Canada, and for which a substantial request has already been developed in Europe.

Consul General Julius G. Lay, formerly stationed at Rio de Janeiro, Brazil, has been transferred to Berlin.

Commodore E. C. Benedict was one of the twelve lifelong friends of the late James McCutcheon, New York linen merchant and banker, who acted as honorary pallbearers at his funeral on July 23, at Greenwich, Connecticut.

William M. Ivins, well known to the rubber trade, with which he was formerly associated, as president of the General Rubber Co., has been retained by William Barnes as counsel in his $50,000 libel suit against Theodore Roosevelt, service of summons in this suit having been effected by his son, James S. Y. Ivins, on July 23.

Frederick D. Clayton, treasurer of the Goodyear Manufacturing Raincoat Co., of 15 East Sixteenth street, New York, has been made defendant in a suit brought by House, Stowe & Co., to recover $10,052, the amount of credit which they claim he obtained for his company through false statements.

James Brien, of Needham, Massachusetts, owner of the Eastern Rubber Co., with offices at 72 High street, Boston, died on June 30 in a hospital in Detroit, where he had gone on business connected with his branch office in that city. His death was the result of an automobile accident two days earlier, when a machine in which he and his brother, Christopher Brien, associated with a Detroit rubber concern, were riding was struck by a street car. Mr. Brien was 48 years old and is survived by his wife.

Mr. Edward Hughes, formerly employed for fifteen years with the Mechanical Fabric Co., of Providence, Rhode Island, and for ten years preceding that period with the Revere Rubber Co., of Chelsea, Massachusetts, has been appointed manager of the rubber thread department of Dr. Cassirer & Co., Charlottenburg, Germany.

Mr. Frederick W. Dunbar, of the importing firm of Dunbar & Co., returned to New York on July 31, after a month's stay in London.

Mr. William A. De Long, who has been engaged for more than a year in settling up the affairs of the New York Commercial Co., returned to New York on July 27 from a business trip to Seattle, Washington.

L. E. WATERMAN.

There is an exceedingly interesting story, in fact a real industrial romance, back of the fountain pen industry in this country. Nearly thirty-five years ago a man who had had a little experience at a good many things (among them school teaching), conceived the idea of a pen that should also contain within itself the ink, so that whenever you had one you would not have to search for the other, came to New York to give this idea practical shape. He found, however, that at least 200 other people had entertained this same conception and that there were about that number of fountain pens already patented. But none of them would work. He examined them diligently and minutely, found where the trouble lay and then devised a new fountain

THE LATE L. E. WATERMAN, FOUNDER OF THE L. E. WATERMAN CO.

pen that should avoid the defects of earlier patents. He made some of his new pens and rented desk space in a cigar store on Fulton street near the Brooklyn bridge.

That was in 1883. During the first year he sold 6 dozen pens. This small sale would have discouraged most men, but Mr. Waterman—Lewis Edson Waterman—was not easily discouraged. He knew his pen was good and would sell as soon as other people found out how good it was. And he was right. He kept on, and in five years the sales had reached an annual figure of 9,000 pens—not a very big sale and yet not bad. Twelve years later, in 1900, the sales had almost reached the quarter million mark—which was much better—and last year a million and a quarter of the Waterman fountain pens were marketed—something of a jump, certainly, from that first annual output of 72 pens.

Here is a reproduction of a photograph of the late Mr. Waterman, who more than any other man made the fountain pen the great institution that it is today, and who not only introduced a very acceptable convenience for the use of the commercial world but incidentally opened up a channel for the use of a considerable volume of rubber every year.

Henry Metcalf, Arthur C. Goff and Charles L. Cate are the owners of the Rubber Specialty Co., doing business in Pawtucket, according to statements filed with the city clerk of that city.

COLONEL COLT INTERVIEWED IN PARIS.

Colonel Samuel P. Colt, president of the United States Rubber Co., accompanied by Mr. and Mrs. Harold J. Gross, sailed for Europe on the "Aquitania" July 1. Colonel Colt expects to be absent until about September 1, and will visit London, Paris, Amsterdam and Aix-les-Bains, combining business with pleasure. The daily papers of recent date contained an interview which Parisian reporters obtained from Colonel Colt when he arrived at that city. According to this account he predicted that crude rubber would go still lower in price.

"The rubber trade," he continued, "is satisfactory. Our company has always been conservatively run; we have transgressed no law, therefore fear no Federal prosecution. It is regrettable that American statesmen have not yet attacked the trust problem scientifically. President Wilson is very disappointing in this respect."

MR. HERMESSEN LEAVES MEXICO FOR ECUADOR.

The readers of THE INDIA RUBBER WORLD will remember the many exceedingly interesting letters contributed to the columns of this publication by Mr. H. S. Hermessen, for many years resident in Mexico. Owing to the disturbed condition of affairs in that republic, which has interfered so much with every line of industry, Mr. Hermessen has left Mexico and gone to Guayaquil, Ecuador, where he has taken a position as chief engineer of the survey of the Trans-Amazon Railway of Ecuador—a line destined to run from Puerto Bolivar, on the Gulf of Guayaquil, to the Amazon, via Zaruma and Loja. This railroad is being built by a French syndicate.

RUBBER MEN IN A NEW FOREIGN TRADE CLUB.

Colonel Samuel P. Colt, president of the United States Rubber Co., and Mr. Elisha F. Williams, one of the vice-presidents of that company, are both members of the organization committee of the "Indian House," a new club located at 1 Hanover Square, New York, organized for the purpose of extending American foreign trade. Among the other members of the organization committee are Lloyd C. Griscom, E. P. Thomas, Charles A. Schieren and Albert H. Wiggin. The officers of the club are as follows: James A. Farrell, president of the United States Steel Corporation, president; J. P. Grace, president of W. R. Grace & Co., treasurer; Willard Straight, of J. P. Morgan & Co., secretary; Edwin N. Hurley, president of the Machine Co. of Chicago, and James R. Morse, of the American Trading Co., vice-presidents.

MR. MACMILLAN CHAIRMAN OF THE RUBBER GOODS SECTION.

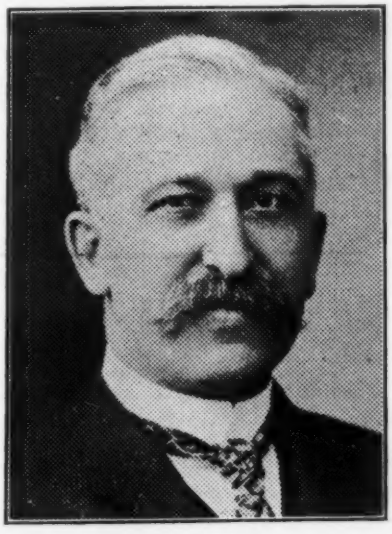
Everybody has heard of the Rotary Club. It is a great international organization with a club in every considerable city. These individual clubs are composed of representative men in the different professions and lines of business, no profession or business being permitted more than one representative in a club. The organization held an international convention in Houston, Texas, late in June, and Mr. John A. MacMillan, general manager of the Dayton Rubber Manufacturing Co., served as chairman of the rubber goods section and presided over the discussions held by the rubber men attending the convention.

DEATH OF G. O. CURRIER.

Mr. George Odin Currier, who died, at the age of 71 at his residence in Jamaica Plain, Massachusetts, on June 27, had never been directly engaged in rubber manufacture or distribution. He, however, played an important part for a great many years in the development of the rubber industry of New England as a note broker; and during the last forty years of his life he had made a specialty of the notes of the large New England rubber companies. In this way he had an extensive acquaintance not only among financiers but among the leading rubber men of that section.

PRESIDENT SCHAFFER OF THE GLOVE COMPANY.

There is nothing in the old adage that "All things come to those who wait." They don't. Things come to those who work. And that has been proved again by the experience of Mr. Frederick F. Schaffer, who has just been elected president of the Goodyear's



FREDERICK F. SCHAFFER.

India Rubber Glove Manufacturing Co. There never was an honor more deserved.

Mr. Schaffer began his career as a manufacturer of rubber when he was a young boy, back in the late 60's, in the factory of the New Brunswick Rubber Co., situated in the town of that name in New Jersey. After acquiring a little experience in this factory he changed, in 1870, to the New Jersey Rubber Co., located in the same town, where he soon was appointed foreman of the shoe making department. Six years later, in '76, the Goodyear Glove Co., Naugatuck, concluded to add a shoe department to its plant and Mr. Schaffer was invited there to take charge of it; and he has been with this company for thirty-eight years, during which time "glove" footwear has become famous the world over. After acting as foreman of the shoe department for nine years he was made superintendent—in '85—of the entire plant; and not very long after that he was handed the Wales-Goodyear factory, situated in the same town, to superintend, additionally. A few years later he was made secretary of the Glove company, and still later became its treasurer; and now he succeeds to the presidency.

He has given up the superintendency of the two mills, his son, Frederick W. Schaffer, becoming superintendent of the Glove company plant, and Myron H. Clark, of the Boston Rubber Shoe Co., becoming superintendent of the Wales-Goodyear mill.

One might imagine from his long career in rubber manufacture that Mr. Schaffer was fairly along in years, but it must be recalled that he got to work when the other boys of his age were still droning over their First Readers. There are two proofs that he is still in his prime—one is his great capacity for work, and the other is this cut of a photograph which was taken of him very recently.

The S. & S. Automatic Tireaze Co. has been incorporated in Marysville, Kansas, with a factory at Frankfort in that state, for the purpose of manufacturing an automatic jack for automobiles.

NEW INCORPORATIONS.

Alden Rubber Co., June 3, 1914; under the laws of Massachusetts; authorized capital, $100,000. Incorporators: George Edwin Alden, Needham; Clarence W. Hoyt, Lowell, and Benjamin E. Phillips, Dedham—all in Massachusetts. To manufacture and deal in rubber and rubber goods and supplies of every kind.

American Para Rubber Co., June 15, 1914; under the laws of Missouri; authorized capital, $10,000. Incorporators: G. A. Wilke, F. E. Rixmann, G. W. Houghton and Wm. C. Lange—all of St. Louis, Missouri. To manufacture rubber goods of every description and to buy and sell rubber products, etc.

Best Tire Co., December 5, 1912; under the laws of New Jersey; authorized capital, $125,000. Incorporators: S. L. Henry, Martin Walker and Edward Spillane—all of Newark, New Jersey. To manufacture and sell automobile and all kinds of vehicle tires, and to buy and sell tire patent rights, etc.

Columbia Tire Co., June 24, 1914; under the laws of California; authorized capital, $500,000, in shares of $1 par value each. Incorporators: Ed. Troan, W. B. Lee, H. W. Griswold and P. L. Huse—all of Los Angeles, California. To manufacture and deal in tires and autos.

Crown Tire & Supply Co., June 17, 1914; under the laws of Delaware; authorized capital, $100,000. Incorporators: I. W. Thompson and D. S. Edmonds—both of Philadelphia, Pennsylvania—and J. M. Frere, Wilmington, Delaware. To manufacture and deal in automobiles, automobile tires, etc.

The Enterprise Tire Shop; June 22, 1914; under the laws of Connecticut; authorized capital, $25,000. Incorporators: Henry J. Bond, of Stamford, and Claude L. Post, of New Canaan—both in Connecticut.

Goodrich Raincoat Co., Inc., July 13, 1914; under the laws of New York; authorized capital, $5,000. Incorporators: Harry Rosenberg, Chas. Becker and Max Becker—all of 840 Broadway, New York City.

Indestructible Tyre Co. of the United States, July 3, 1914; under the laws of Delaware; authorized capital, $1,000,000. Incorporators: John McLaren, F. B. Knowlton and S. V. Dowling—all of 154 Nassau street, New York City. To manufacture, purchase, sell and deal in tires for vehicles—pneumatic or otherwise—made wholly or partly of rubber, metal, cloth or any other material.

Long Wear Reliner Co., Inc., July 8, 1914; under the laws of New York; authorized capital, $10,000. Incorporators: Thomas P. Octigan, 105 West Monroe street, Chicago—Albert T. Norton and Mary T. Norton—both of Port Jefferson, New York. To deal in rubber goods, tires, etc.

Nichols Manufacturing Co., July 7, 1914; under the laws of Delaware; authorized capital, $50,000. Incorporators: Arthur H. Tyler, Riverside; Charles A. Wright, Providence, and O. Z. Peterson, Cranston—all in Rhode Island. To manufacture jewelry of all kinds, rubber novelty goods, rubber of all kinds, celluloid and celluloid novelties.

Pacific Rubber & Tire Manufacturing Co., May 18, 1914; under the laws of Washington; authorized capital, $25,000. Incorporators: C. A. Kilbourne, H. C. Ewing, E. L. Webster and Arthur M. Griffin—all of Seattle, Washington. To buy and sell automobiles and auto accessories, also rubber tires and rubber accessories of all kinds.

Prenzel Sectional Pneumatic Tire Co., June 22, 1914; under the laws of Pennsylvania; authorized capital, $250,000. Incorporators: A. H. Prenzel, Luther E. Ryan, L. Samuel Marshall—all of Halifax, Pennsylvania—and Frank B. Clayton, Lewisburg, Pennsylvania. To manufacture and sell vehicle tires and other rubber products.

Puncture Seal Co., Inc., June 25, 1914; under the laws of New York; authorized capital, $5,000. Incorporators: Henry D. Bahn, 314 East One Hundred and Thirty-seventh street; Frank S. Murray, 400 West Fifty-seventh street, and Frank Eber, 1313 Clinton avenue—all in New York City. To manufacture compounds for mending inner tubes, tire accessories, etc.

Western Tire Co. of America, Inc., June 26, 1914; under the laws of New York; authorized capital, $5,000. Incorporators: L. Walter Lisberger and Joel Jacobs—both of Wellington Hotel—and Frank H. Cross, 1650 Broadway—all in New York City. General tire business.

TRADE NEWS NOTES.

The National Association of Waste Material Dealers has established headquarters in Boston, at 170 Summer street, in charge of C. M. Haskins and Mark Sherwin, respectively secretary and treasurer of the association.

Bids are now being received, through D. A. Crone, an architect, with offices in the Oliver Building, Pittsburgh, on a factory building 82 x 250 feet, two stories and basement, at Niagara Falls, for the Santo Rubber Co.

Fan ventilators, 48 inches in size, have recently been installed in the boot and shoe department of The B. F. Goodrich Co., at Akron, by The Burt Manufacturing Co. of that city.

The property loss by fire in the United States during the year 1913 amounted to $203,763,550.

The plant of the Leicester Rubber Co., of Catasauqua, Pennsylvania, was destroyed by fire on the morning of July 19, entailing a loss of approximately $60,000. The origin of the fire, which started outside the plant, is not known, and only a small amount of insurance was carried. The company manufactured a line of rubber mats and other rubber goods, and I. Fineburg, of the Trenton Scrap Rubber Supply Co., of Trenton, New Jersey, is said to have been the principal owner, while H. Bernstein, also formerly of Trenton, was manager.

Employes of the Seamless Rubber Co., of New Haven, Connecticut, to the number of forty-five, held their annual outing on Saturday, July 18, at Smith's South End grounds. The outing, which was an extremely successful and enjoyable one, was also attended by superintendents and officers of the company. An interesting feature of the event was the shore dinner served at 3 o'clock. Prizes were offered and awarded in numerous athletic contests, and a baseball game between male and female participants resulted in the astonishing score of 14 to 4 in favor of the latter.

A banquet was served at the Baltimore Hotel, Kansas City, Missouri, on the evening of July 17 to about eighty members of The B. F. Goodrich Co.'s force employed in that city and vicinity, who had gathered to discuss plans for the standardization of business, and for the elimination of cut throat competition. Representatives of the Akron office of the company were present at the banquet, at which R. L. Rickey, manager of the Kansas City branch, presided.

The forty-second annual meeting of the Carriage Builders' National Association will be held in Atlantic City, New Jersey, during the week commencing September 27.

A HUDSON RIVER CABLE 16,000 FEET LONG.

The longest submarine cable ever laid by the New York Telephone Co. is one that extends under the Hudson River from Nyack to Tarrytown. It is 16,000 feet long. Because of the length of this cable and the shallowness of the river at both sides, it was necessary to use a scow drawn by a light draught tug. The cable was placed on the deck of the scow in the shape of a gigantic figure eight, so that it could be fed down into the river without kinking. A strong brake was placed on the stern of the scow to prevent the cable from running overboard. This great length of cable was laid in less than an hour and a half.

New Machines and Appliances.

DIES FOR PRESSED RUBBER COMBS.

WHEN hard rubber stock in a plastic condition is pressed between comb forming dies of the usual construction, it is impossible to force by pressure from between the dies all of the material not required in the comb. This is one of the reasons why so few rubber combs have been formed entirely by stamping out in dies, with the comb teeth completely formed by a single operation.

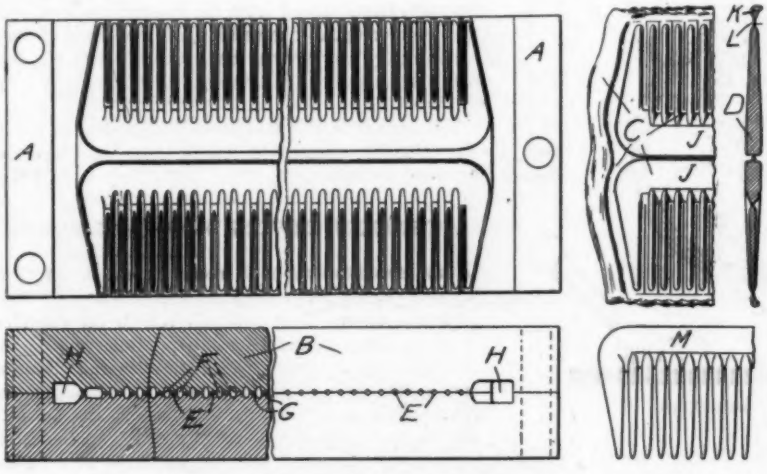


FIG. 1. WIELAND'S HARD RUBBER COMB DIES.

In an invention of F. Wieland's, the stock is pressed between dies arranged to form a comb blank, in which all of the teeth are practically of the desired final shape and size. The superfluous stock that remains between the teeth and at the ends and sides is connected to the comb by thin webs which are easily broken away. Reference to the accompanying drawings in connection with the following description will give an idea of the construction of these dies and the manner in which the comb is formed.

In Fig. 1, *A* is a plan view of the lower half of the die and *B* is a partial cross section and part exterior view of the upper and lower halves. *C* shows the shape of the rubber blank after it has been pressed and removed from the dies and *D* is a cross section of the same blank. The dies are formed so that when the two halves are placed together, spaces *F* are left for the teeth. Between these spaces are smaller spaces *E*, which receive the surplus material pressed out from spaces *F*. The parts of the dies which separate the spaces *E* and *F* are formed with sharp edges *G*, so that when the dies are pressed together the surplus rubber in spaces *E* is separated from that in spaces *F* by a very thin web, which is afterward easily broken away. The dies are also grooved at *H* to receive the excess material pressed from the ends of the comb blank.

With this die the stock to form the comb may be of much less thickness and width than that of the finished product. The stock from which the comb is formed is materially thickened and spread laterally during the pressing operation, filling up spaces where necessary and squeezing out surplus material where not needed. The surplus material squeezed from the center of the stock to form the web between the backs of the combs, is forced into the hollow spaces of the die to form the backs *J*. The surplus rubber not needed for the comb teeth is forced out at the edges as shown at *K*, and is connected with the comb blank by thin webs *L*. The two comb blanks arranged back to back are easily broken apart and the superfluous stock removed by breaking off the thin webs. The combs are then finished by buffing. The drawing *M* shows the form of the completed comb.

Fig. 2 shows another form of mold for producing twinned combs with interlocking teeth, which are connected by thin webs. A plan view of the lower half of the die is shown at *A* while *B* shows a partial cross section of both the upper and lower halves. *C* is an end view of the dies, showing the relative shape and size of the rubber stock *D* before being pressed. *E* shows the comb blank after being pressed and shows how the material completely fills up the spaces to form the comb back and teeth. The teeth in a comb formed by this die are necessarily closer together than in the die shown in Fig. 1 and the cutting edges of the opposing dies are necessarily sharper and deeper. When the two dies are pressed together the rubber is first forced longitudinally and then across the dies, or along the tooth spaces toward the back of the comb.

In pressing combs with a die of this shape the large end teeth *F* are bent out of their normal position to provide a receiving space for material to form the teeth *G*. After the combs have been separated by breaking the thin webs which connect them, the end teeth *F* are forced by the application of heat and pressure back to their normal position, after which the combs are ready to be finished by a buffing wheel.

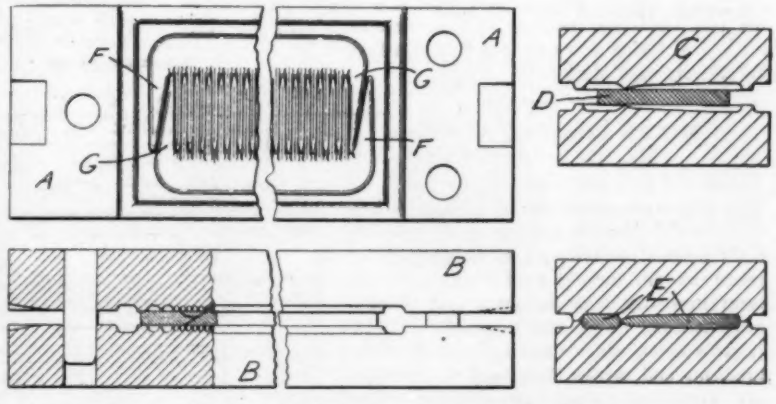


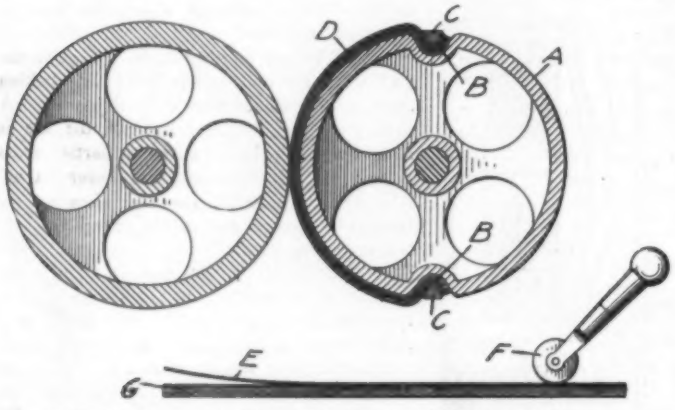
FIG. 2. DIES FOR FORMING TWINNED RUBBER COMBS.

The Werner & Pfleiderer Co., Saginaw, Michigan, is making a new machine, the Universal Mixing and Kneading Machine, designed especially for use in the manufacture of chewing gum. The machinery for this industry has heretofore been adapted from other lines and changed to suit the different requirements.

RE-SURFACING PRINTERS' BLANKETS.

ONE of the largest items of expense in connection with printers' and lithographers' presses has always been the replacing of the rubber blankets. According to a new process, patented by Gustave Kush, of New York City, old blankets may be re-surfaced with a covering of new rubber, thus considerably decreasing the expense of supplying blankets.

Rubber press blankets made in the usual manner have a backing of fabric and a covering of rubber vulcanized together at the factory. If the rubber surface becomes creased, pitted or otherwise worn, the blanket no longer meets the requirements of perfect work, and must be discarded. In order that the rubber surface may be stripped from the fabric, the new blanket has a thin layer of unvulcanized rubber between the fabric and the exterior vulcanized cover. In the accompanying drawing, the blanket roll *A* has two grooves *B*, in which the blanket is clamped by bars *C*. When the blanket becomes worn, these bars are removed, the blanket taken from the roll, and the outer covering *D* stripped off. A new sheet *E* of rubber of the proper size is then cut and rolled smoothly, by means of a hand roller *F*, over the surface of unvulcanized rubber *G*. The blanket is then as good as new, and it is quickly replaced on the roll, obviating the loss of time necessary with the older method of taking down the roll and attaching an entirely new blanket.



KUSH'S PROCESS OF REPAIRING PRINTERS' BLANKETS

A MIXER THAT ELIMINATES MANUAL LABOR.

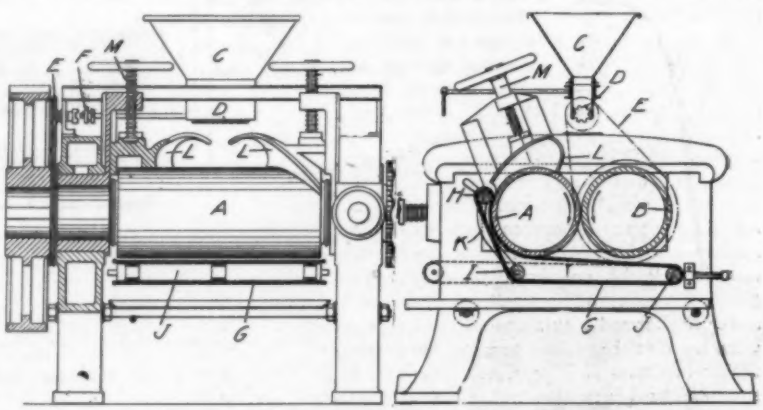
WE illustrate herewith a new rubber mixer which has an attachment for continuously turning the rubber over as it passes between the rolls, thereby eliminating the manual labor necessary with the usual type of two-roll machine. This mixer also has an adjustable apron which catches the unmixed ingredients and carries them back to the upper part of the rolls to be mixed with the rubber.

The two drawings of the machine show an end view and a side elevation, both partly in section. The machine has two horizontal rolls *A* and *B*, the first of which is steam-heated. Above the rolls is a hopper *C*, having a sufficient capacity to hold all of the ingredients except the rubber, for one batch. At the bottom of the hopper is a cylindrical distributor *D*, driven by a chain *E*. This device distributes the powdered ingredients over the rubber as it passes down between the rolls. The distributor may be started or stopped by operating a clutch *F*.

In order to catch and carry back the unmixed ingredients to the roll *A*, an endless apron *G* is carried upon rollers *H*, *I* and *J*. The roller *H* is mounted upon two side arms *K*, which swing around the axis of the roller *I*, so that the apron may be raised in contact with the roll *A*, or lowered into a horizontal position, as indicated by the dotted lines. When the apron is raised it is driven by friction, and the ingredients caught by it are carried to the top of the roll *A*, and again passed through the mixer with the rubber.

At the ends of the roll *A* are two blades *L*, shaped like plowshares. They may be raised and lowered by means of hand-screws *M*. When lowered in contact with the roll *A* they continuously scrape the rubber from the roll and turn it over, so that fresh surfaces are exposed to take the compounding ingredients falling from the hopper. By means of this uninterrupted overturning of the gum, effected mechanically and without manual assistance, it is said that a homogeneous mixture can be obtained in a remarkably short time.

This mixer is the subject of United States patent No. 1,100,768, granted to André Olier, of Clermont-Ferrand, France.



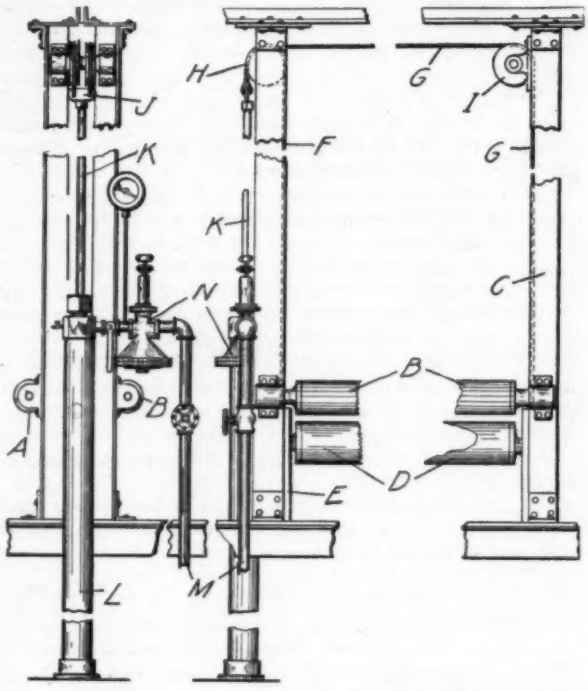
OLIER'S MIXING MACHINE.

A TENSION DEVICE FOR CALENDERS.

IN the specifications of a recent patent is described a device for maintaining an even tension on a strip of fabric passing from a supply roll to the calender, or from one calender to another. Referring to the accompanying drawings, which show an end elevation and a side view of the apparatus, it comprises two idler rolls *A* and *B* attached to the opposite sides of the frame *C*. Between these two rolls is a third roll *D* mounted in carriages *E*, which slide up and down between the frame members. This sliding roller is raised and lowered by means of cables *F* and *G*, attached to the carriages *E*, and passing over sheaves *H* and *I*. These cables are secured to a cross-head *J* at the upper end of a piston rod *K*. On the lower end of this rod is a piston, which reciprocates in a hydraulic cylinder *L*. Water enters the cylinder through a pipe *M*, and the pressure is controlled by a regulator *N*.

The operation of the device is as follows: The fabric is carried under the roll *A* over the sliding roll *D*, and under the roll *B*. During the movement of the fabric over these rolls the regulator *N* is set to maintain a pre-determined pressure on the piston in the cylinder *L*. The result is to force the piston down, to raise the sliding roll *D*, and to impose an even pressure on the fabric passing over the rollers. For instance, if any slackness occurs in the fabric while passing to the calender, the roll *D* raises, and the pressure on the piston causes the surplus

fabric to be taken up. On the other hand, if the strain on the fabric is greater than the pressure permitted by the regulator, enough air will leak past the piston to permit the roll to move downward, relieving the tension on the fabric.

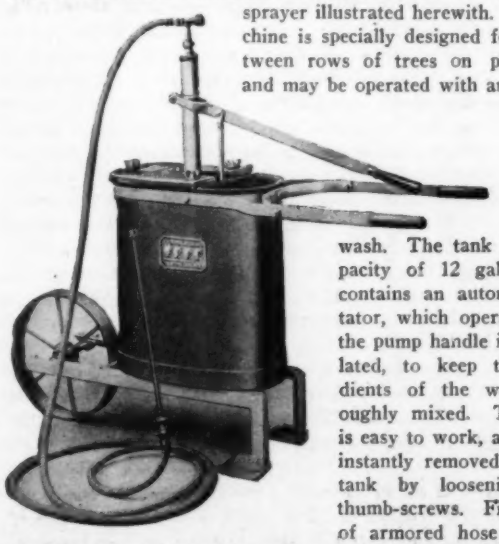


APPARATUS FOR REGULATING THE TENSION IN FABRICS.

The patent is No. 1,100,039, granted to Wm. C. Tyler and Edward Nall, and assigned to The Goodyear Tire & Rubber Co., of Akron, Ohio.

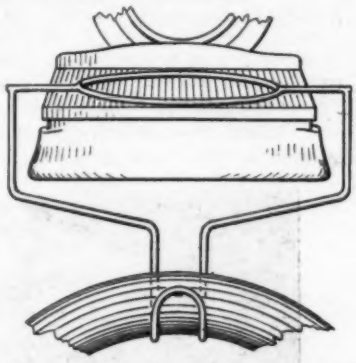
THE "FOUR OAKS" SPRAYER.

Among the machinery and appliances shown at the recent International Rubber Exhibition in London was the "Four Oaks" sprayer illustrated herewith. This machine is specially designed for use between rows of trees on plantations, and may be operated with any kind of wash. The tank has a capacity of 12 gallons, and contains an automatic agitator, which operates when the pump handle is manipulated, to keep the ingredients of the wash thoroughly mixed. The pump is easy to work, and can be instantly removed from the tank by loosening three thumb-screws. Fifteen feet of armored hose and two nozzles are supplied with each machine. [The "Four Oaks" Spraying Machine Co., Sutton Coldfield, Birmingham, England.]



A DEVICE FOR THE CONVENIENT WEIGHING OF TIRES.

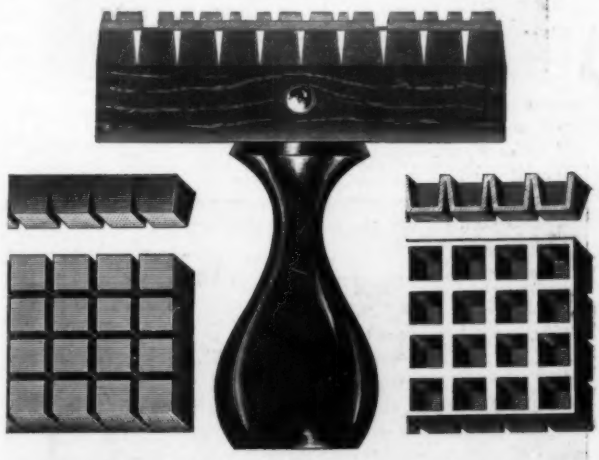
The drawing shows a method used in a number of rubber factories for weighing such articles as tires which are not conveniently placed upon the ordinary scale platform. From the drawing it will be seen that the device consists merely of a hook made from heavy wire and bent in such a way that it hangs from the platform of the scale without interfering with the balance. With the device attached to the scale it is only necessary to hang the tire on the hook and obtain the total weight of the hook and tire together, after which the weight of the hook is subtracted. In order to eliminate this trouble the scale may be previously balanced with the hook so that the weight of the tire is obtained directly.



SHOWING HOW TIRES CAN BE WEIGHED ON THE ORDINARY SCALE.

THE "UNIVERSAL UNIT" CUSHION STAMP.

The efficiency of a rubber stamp is considerably increased by mounting the type on a flexible cushion. There are several types of cushion stamps, but the latest design, illustrated herewith, has been introduced by The R. H. Smith Manufacturing Co., of Springfield, Massachusetts. The cushions are molded in the shape of hollow pyramids, open at the lower ends and connected at the bases by thin webs. The sheet is separable at any point and in either direction, making a cushion of any required size to fit any shape of die. When the units are separated a finished edge is left at the base of the cushion, and there is no waste of rubber.



In the illustration, the figure on the left shows the tops of two sections, while that at the right shows how the cushions are hollowed out. The central figure shows the sheet of type attached to the cushion, which is mounted in the usual manner upon a wooden block and handle. The cushion is made in sheets 10 inches square, each containing one hundred units—a form very convenient for the stamp manufacturers.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The Editor's Book Table.

OFFICIAL GUIDE TO ROYAL BOTANIC GARDENS.

OFFICIAL GUIDE TO ROYAL BOTANIC GARDENS, PERADENIYA, Ceylon. By H. F. Macmillan, F.L.S., Director. Colombo, 1913: Plâté & Co. [Boards, 48 pages, with 52 illustrations.]

TO those who are not likely to have an opportunity of visiting "The Garden of Eden," as Peradeniya has been called, the handbook compiled by Mr. Macmillan will prove a valuable addition to their botanical and topographical knowledge of the

MAIN ENTRANCE, PERADENIYA GARDENS.

tropics. The 150 acres occupied by the gardens being situated about 1,600 feet above sea level, with a mean annual temperature

AVENUE OF ROYAL PALM (*Oreodoxa Regia*) PLANTED 1898.

of 76 deg. F., are in a position where vegetation has every opportunity of development.

Having been curator of the gardens since 1895, Mr. Macmillan on his appointment to the post of director in 1913 had accumulated a store of information on the subject, which has given him special facilities for the task so successfully accomplished in this guide book.

The history of the gardens during their century of existence is succinctly told, from their transfer to their present location in 1821 to their subsequent extensions and the opening of branch gardens at Badulla and Anuradhapura.

The reader is first conducted through the stately row of *Amherstia nobilis* trees imported from Burma in 1860, situated near the main entrance, a view of which has been reproduced through the courtesy of the publishers. Next in order comes the "Palm Circle Drive," followed by the trailing plant *Aristolochia Pergola* and leading to the "Octagon Conservatory" with its store of indigenous and imported flora. The "Orchid House" forms the next feature of attraction, and is followed by the *Ficus elastica* or India rubber tree with its fantastically shaped roots covering the ground. The "Travelers' Tree" and Papaw trees continue the story till the "Avenue of Royal Palm" (*Oreodoxa regia*) is reached, which is shown in the accompanying illustration.

Each of the 58 artistic illustrations has its own history, which would repay perusal by any one interested in the picturesque development of natural scenic beauties.

THE WATERPROOFING OF FABRICS. BY DR. S. MIERZINSKI. Translated from the German by Arthur Morris and Herbert Robson, B.Sc. 1914, second edition; first edition, 1903. London: Scott, Greenwood & Son. [Octavo, 128 pages, 29 illustrations. Price, 5*s*.]

THIS is an attractive title to the rubber man, but it will probably prove rather disappointing reading. The first noticeable feature of the book is that the author does not seem to consider rubber as a waterproofing material or describe any of the work which has made the name Macintosh famous. In fact, Macintosh is not mentioned except in the chapter on British patents, and there quite disparagingly.

What the author seems to regard as the only proper waterproofing is the impregnation of cloth with a metallic oxide, a soap or a tar, to render it rain tight, though it is explained that all these fabrics will eventually leak.

There is a chapter on the preliminary treatment of fabric by washing with soda lye, drying, etc., which shows the way fabrics are treated. One chapter entitled "Waterproofing With Acetate of Alumina" describes a method of soaking the fabric in acetate of alumina and drying down to form a basic acetate which is not quite waterproof. This is followed by a chapter on drying, where the process of after treatment with soap to form an alumina soap is described as a process of absolutely waterproofing fabrics. Here the author states that it is customary to put rubber in the soap. "This is easily done," he says, "as the soap solution has the property of forming emulsions with solutions of india-rubber. . . . The emulsion can only be separated by the action of acids or direct steam."

A process of waterproofing with paraffine is described, which is merely frictioning it on with calenders. A number of other methods of waterproofing are given and the manufacture of tarpaulin and tarred fabrics is fully described. It appears that the use of calenders for frictioning on tar in the same way that rubber is put on fabrics would be a great step forward, as the apparatus described as now being used looks rather crude, though some features of it approach the calender quite closely. Probably those who are putting rubber solutions on cloth would receive a number of hints, particularly in the line of handling the cloth both in preliminary treatment and in final calendering and drying, as much of the work is devoted to this subject.

There is a final chapter by the translators describing British patents on waterproofing, in which they say, "It may be taken for granted that if a process is worth anything it is patented in England"; which is a complacent British way of looking at things. The translators, however, seem to know more than the author, as they comment intelligently on some of his more obvious lapses.

The list of patents will be valuable to anyone involved in patent litigation on waterproofing.

MOLDED ELECTRICAL INSULATION AND PLASTICS. BY EMILE Hemming. 1914. Ward, Clausen & Co., 200 Fifth avenue, New York. [Octavo, illustrated, 208 pages.]

HERE is a volume which contains much practical information of considerable interest for the rubber manufacturer. It deals with plastics for a special purpose, the method of manufacture differing considerably from that used in working the usual rubber articles; but perhaps these methods might be applied to rubber for quite a few purposes.

A glance at its contents shows that a large number of substances are now made into molded insulators containing no rubber, for formerly rubber was used to a much greater extent than today. In view of the cheapening of the raw material, allowing cheaper products to be made now, it is perhaps worth while for the rubber manufacturer to ask himself if he cannot get back some of the business lost on account of the high prices he was formerly compelled to charge.

In the introduction the author says, "A few years ago the choice of insulating materials lay practically between porcelain, hard rubber and the so-called shellac compounds, but today a considerable number of substances of widely differing properties and constitution are offered on the market."

"Molded insulation" is defined as a plastic mass composed fundamentally of a binder and a filler and formed in molds or dies, usually under pressure. The materials entering into them are referred to as "composition." The author says, "Ten years ago porcelain was most widely used as an insulator, but hard rubber with fillers such as asbestos, called 'vulcanized asbestos materials,' were largely used and were excellent in every respect except price and the inability of rubber to stand high temperatures."

This author divides molded insulation into nine classes, as follows: Class A, organic hot molded materials; Class B, organic cold molded materials; Class C, inorganic cold molded materials; Class D, ceramics; Class E, rubber compounds; Class F, organic plastics; Class G, synthetic resinous products; Class H, hardened fiber materials, and Class I, molded mica.

Class A comprises all the sealing wax compounds and Class B those in which a solvent is used. It would appear that rubber might enter into the first when heated to a plastic condition and rubber cement into the second or Class B. Class C is of the Portland cement type and is of no interest to the rubber man as a possible manufacture. The same is true of the ceramics of Class D.

Of Class E the author says, "Among the various materials employed in the manufacture of molded insulation, rubber is the only product which in itself, without intermixture of a filling or strengthening medium, presents all the desirable qualities of an insulator, combined with the necessary mechanical strength and other requisite physical properties."

Class F includes celluloid, casein and other plastics than rubber.

Class G includes the phenol, formaldehyde and similar condensation products such as bakelite, condensite, etc.

Vulcanized fiber, which is called Class H, is vulcanized by chloride of zinc, etc., or it may be treated with resinous binders. Mica, which is given in Class I, must also be mixed with resinous binders to be used as a plastic.

A long chapter is devoted to raw materials, the rubber manufacturer being familiar with most of these as fillers, though many substances are largely used in the insulators that are little used in the rubber trade.

A good description of the necessary properties of molded insulation is given under the heads of "Life," "Molding," "Puncture Test" (dielectric strength), "Mechanical Strength," Weatherproof Qualities," "Heat Proof Qualities," "Resistance to Chemical Action," "Machining of Molded Pieces" and "Color and Appearance." Molds and dies are treated of at length. The selection of materials is also discussed and a large number of illustrations are given which are valuable as showing the forms of molded insulators now in demand. It is to be observed that many forms have metals, including brass and copper, molded into them.

The work concludes with about fifteen pages of results of electrical and mechanical tests on various specimens of different kinds.

Any manufacturer of molded goods, whether for insulation or otherwise, will certainly receive enough hints to repay him for a perusal of the work, and even the description of working other plastics is instructive.

Throughout the book are the recurring statements as to the desirability of rubber for this work and the lament about high prices. The latter objection is rapidly disappearing, and perhaps the rubber industry can now re-enter some of this lost field.

ANNUAL REPORT OF THE SECRETARY OF COMMERCE.

It will be recalled that by the transfer in August, 1912, of various bureaus from the Department of Commerce and Labor to the newly created Department of Labor, the more strictly commercial sections were left in the hands of the former; its name being changed to the Department of Commerce. As now constituted, it includes nine bureaus and the office of the Secretary, with five divisions, the bureaus being respectively those of Foreign and Domestic Commerce, Corporations, Standards, Census, Fisheries, Lighthouses, Coast and Geodetic Survey, Steamboat Inspection Service and Navigation.

Manufacturers will be very much interested in the first annual report of Secretary William C. Redfield, and particularly in that part of his report that covers the bureaus of Foreign and Domestic Commerce, Corporations, Standards and the Census. The publication known as "The Daily Consular and Trade Reports," published by the Bureau of Foreign and Domestic Commerce, has proved exceedingly popular, the demand being considerably in excess of the edition so far printed.

Under the head of publicity work are also mentioned the semi-weekly press letters of statistical information; the "Monthly Summary of Commerce and Finance"; as well as various quarterly statistical Statements, and the annual volume of "Commercial Relations of the United States." With regard to the Division of Statistics, it is urged that its work should receive much more attention and support than it now gets from Congress.

A perusal of this comprehensive report gives a good idea of the work achieved and contemplated by the department in its re-organized form, for the benefit of American commerce.

The report of the proceedings of the Agricultural Society of Trinidad and Tobago shows the total exports of rubber from those islands for the first six months of the year to have amounted to 3,785 pounds, as against 1,505 and 2,076 pounds in the same periods of 1912 and 1913.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

NEW TRADE PUBLICATIONS.

ANOTHER HANDSOME RUBBER GIRL.

PEOPLE in the rubber trade with artistic appreciation will recall the handsome young women (as reproduced by lithography) that have emanated from the Pennsylvania Rubber Co., of Jeannette, Pennsylvania. Two years ago "Miss Jeannette" made her debut, and last year it was "Vecelia"—and now comes "Euphemia," being a life size presentation, head and shoulder view, of a very handsome blondish young woman with pink cheeks and dark brown eyes, and hair to match, and wearing exactly the sort of hat that such a young woman would be likely to wear in the summer season. The full size of the panel is 34 x 20 inches. The size of the lithograph print is 20 x 17 inches, and the painting is reproduced in ten or a dozen colors. The name of the lithographers is not vouchsafed, but they have done their work in this instance exceedingly well.

The name "Euphemia" was selected for this attractive young person both because it seems to fit her, and in the opinion of the company it also fits their goods admirably, for it is derived from two Greek words, *eu* meaning "well," and *phama* meaning "voice" or "word," and being interpreted may be said to mean "well spoken of."

Under the picture is a line "Pennsylvania Oilproof Vacuum Cup Tires," and the name and address of the company. It is a fine piece of advertising and is likely to cause much dissension in all offices receiving only one copy.

DAVID BRIDGE & CO.'S NEW CATALOG.

With a view to keeping their friends abreast of their latest improvements, David Bridge & Co., of Castleton, Manchester, England, have just brought out a catalog entitled "Section K3. Bridge's Rubber Machinery for Plantation and Wild Rubbers," which is intended to supplement that of "Section K2," published in 1911. To those not fully acquainted with the products of this firm, this catalog will prove of special interest, containing, as it does, upward of 70 illustrations referring to 27 classes of machinery and appliances for the preparation of plantation and wild rubbers. Six types of macerating and crêping machines, and one with name of estate engraved on back roller, are first illustrated, followed by hand and power-driven roller machines.

Next in order comes the "Universal Patent Scrap Rubber Washing Machine," with its various driving arrangements, after which are shown vacuum drying and surface smoking plants, including the "Dacostidge" combination. Rubber blocking presses follow, as well as a number of engines, boilers and other mechanical adjuncts. Prominence is then given to the Da Costa "Rapid" smoking coagulator, as well as the Wickham "Hard Cure" process, of the machinery for which Messrs. Bridge are the sole makers. Other features of the catalog are laboratory vulcanizing plants, as furnished the Department of Agriculture, Federated Malay States, as well as experimental appliances supplied to the Technical College at Delft (Holland), and to the London Imperial Institute.

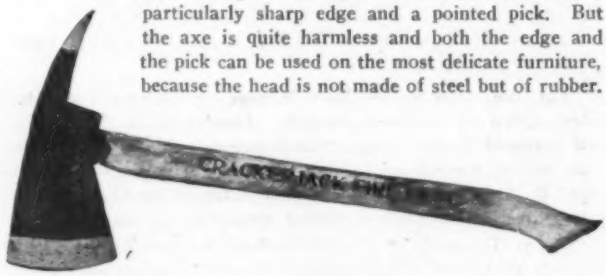
Standard machinery for rubber manufacturers is referred to, though space forbids its complete enumeration, but illustrations of leading types call attention to that feature of the Bridge production. Various special machines for plantation purposes are likewise shown.

A FIREMAN'S AXE OF RUBBER.

The American Rubber Manufacturing Co., of San Francisco, have recently issued a handsome catalog with stiff paper covers containing 126 pages, describing and illustrating the various types of hose which they manufacture and also the great variety of accessories which they carry, including: Hose couplings and nozzles; gaskets; firemen's landing pads; axes and other firemen's implements; gongs; ladders; firemen's clothing, caps and badges, and a variety of extinguishers. In describing their fire hose they call attention to the fact that good hose is the main essential in any fire service, as the bursting of a single section may not only mean the destruction of an immense amount of property, but of human life itself. They state that it is the manufacturer's duty to produce "a water-conducting hose which will be light, pliable, compact, free from friction, kinking or twisting, and at the same time strong and flexible." They add that in their manufacture of fire hose all these requirements are fulfilled.

The last few pages of the book are given over to a series of tables that will be found valuable to those interested in fire departments. These tables cover the amount of hydrant pressure required to send a stream to a certain height or distance with nozzles of various dimensions. They also give the discharge of water in cubic inches through nozzles of various sizes. Other tables give the capacity of cylindrical tanks and systems. Much other information is contained in these tabulations.

Accompanying the catalogue is a fireman's axe, a foot in length and having a head that looks like steel with a particularly sharp edge and a pointed pick. But the axe is quite harmless and both the edge and the pick can be used on the most delicate furniture, because the head is not made of steel but of rubber.



This is an advertising device which the fireman will appreciate—and his young son appreciate even more.

CATALOGS OF THE HAZARD MANUFACTURING CO.

A complete set of catalogs to hand from the Hazard Manufacturing Co., of Wilkes-Barre, Pennsylvania, covers the varied product of that concern. Its rubber-covered wires and cables represent the experience gained during twenty-five years of successful manufacture. The materials used, it is claimed, remain in service thoroughly water and weather-proof, while the slow-burning weather-resisting wires are internally saturated with a fireproof compound.

Quotations and price lists of the various forms of insulated wire form a special catalogue, with a large number of artistic engravings of buildings and locations where the "Hazard" wires are used. These include the "Calumet & Hecla" mines at Calumet, Michigan; the "United Verde" copper mine at Jerome, Arizona; Marie Antoinette Hotel, New York; Pennsylvania Trust Building, Philadelphia; a group of United States warships, and various

other scenes illustrating the subject of "Hazard" insulated wires.

The various appliances required for their installation and operation are shown in detail, the set of a dozen catalogs and price lists being a valuable addition to the reference libraries of those interested in the subjects dealt with.

The Firestone Tire & Rubber Co., of Akron, is distributing a small booklet which has as its object the introduction and sale of cycle tires, the production of which was started by this company only a few months ago. The tires are made with non-skid and corrugated treads, and tubes may be had in either red or gray. The booklet also calls attention to repair materials and gives addresses of 79 domestic and 29 foreign branches, agencies and service stations maintained by the company.

The Superior Type Co., of Chicago, manufacturers of supplies of every nature for rubber stamp manufacturers, have just issued a 33-page illustrated treatise on "Rubber Stamp Making." The purpose of this book is not only to enlighten the beginner but also to assist those who though experienced are not obtaining the best results, and primary instructions are given, which include: Descriptions of the required equipment, with illustrations of molding press, vulcanizers, motor driven power saw and power drill with self-centering table; details of the necessary materials—stamp rubber, sponge rubber, rubber dam, rubber cement, compounds, etc.; instructions in setting up the type form so as to avoid waste of rubber; equipment for and manner of making molds; mold trimming and drying; vulcanizing, and mounting. The book concludes with a word of friendly advice to the manufacturer to "Make the very best goods possible and then have backbone enough to ask a fair price from the buying public." It is an interesting book and will doubtless prove of value to stamp manufacturers generally.

The title "How to Get More Mileage out of Your Tires" has been given to a catalog recently distributed in the interest of Diamond Rubber Goods, manufactured at Akron, Ohio. This catalog is divided into three sections, the first of which is devoted to types of tires and styles of treads, also to tubes and accessories. The second section describes the making of the various styles of tires and the injuries to which a tire is liable in use; while the third section gives instruction in repairs and the necessary care to enable the buyer to "get the mileage he pays for from the tire he buys."

The July calendar issued by W. G. Brown & Co., of Cincinnati, dealers in crude and reclaimed rubber, has as its decorative feature another of the outing scenes so popular and appropriate at this season. This particular picture shows the sportsman making "flap-jacks" over a camp fire, the materials for which the guide, who stands in the background with axe in hand, has evidently supplied through strenuous effort.

Holmes Brothers, makers of rubber molds and special machinery, Chicago, are distributing acceptable advertising matter in the form of a blotter. This blotter, in addition to containing a calendar for the month and setting forth the address and the business of the firm, shows in colors a harvest scene in Hertfordshire.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE "DUPLEX" COLLAPSIBLE CORE.

A NEW type of collapsible tire core has been developed and placed on the market by the Birmingham Iron Foundry. The core is being made at the company's branch factory at Akron, Ohio.

Fig. 1 in the accompanying illustrations shows the core with all of its component parts, and Fig. 2 shows a section of the core and the method of using the pinch-bar, which is the only tool necessary, for assembling and taking the core apart. The outfit consists of a cast-iron core of the usual design, with an internal

FIG. 1.—BIRMINGHAM "DUPLEX" COLLAPSIBLE CORE.

projecting flange. In the upper face of this flange is an annular groove, the inner wall of which is slightly undercut. For retaining the core sections in position, a splitspring or expansion ring is employed. The inner edge of this ring is cut at an angle corresponding with the inner face of the groove, and the outer edge is slightly tapered. Over this expansion ring is placed a locking ring, which fits in the groove between the core flange and the expansion ring.

FIG. 2.—SECTION OF THE "DUPLEX" CORE.

To assemble the core, the sections are placed together on a table and the locking rings placed in position. The upper ring is tapped lightly with the hammer end of the tool, forcing the locking ring into the groove and drawing the sections securely together. To take the core apart, all that is necessary is to insert the pinch-bar between the locking ring and the core flange, to pry the ring from the groove.

THE BRISTOL COMPANY HAS A BOSTON BRANCH.

The Bristol Co., of Waterbury, Connecticut, has opened a branch office in the Old South Building, Boston, in charge of Mr. F. H. Emerson, one of its sales engineers. This year, by the way, completes the first quarter century for this company, and its growth has been so rapid that its floor space has doubled every five years. Its success has been particularly marked since Mr. William H. Bristol, the president of the company, took over its management, some six years ago. Over 65,000 Bristol recorders have been sold—which is certainly a notable record.

Should be on every rubber man's desk—The Rubber Trade Directory of the World, 1912.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE STATE OF THE TRADE.

THE rubber trade generally is decidedly quiet, following the slackness in the great engineering and cotton industries of the north of England. A lively demand—or the reverse—for mechanical goods has come to be recognized as the index of good or indifferent trade, other branches of the manufacture depending more upon special circumstances, among which the prevailing weather takes rather a prominent position. Motor tires, both for pleasure and commercial vehicles, continue in good demand, but owing to increased competition from home and abroad individual profits in the majority of cases show a considerable reduction, a position of affairs which seems likely to become even more acute.

The state of trade is of course against the raw rubber interests, manufacturers preferring to buy only for their immediate requirements. This policy seems pretty general, and though there is no organized arrangement to depress prices it is recognized generally in the trade that the policy of buying from hand to mouth tends to keep prices down; and it is confidently anticipated that the next month or two will see a further depression. No immediate remedy from the rubber growers' point of view seems likely, as it will take some time for the rubber lawn tennis court to establish itself in popular favor.

I am told that the court at the Rubber Exhibition cost £500 to make, and I have also been assured by others that they would be glad to make one at half that price. Presumably the usual state of affairs will result if such courts come into demand, i. e., prices will be cut and the substitute court become rampant, to the general discredit of the rubber court.

To revert to raw rubber for a moment, there is undoubtedly a good deal in Mr. Herbert Wright's contention that planters are acting more in the manufacturers' interest than their own in giving full publicity to their costs of production, forward sales, etc. Mr. Wright's refusal, as chairman, to give details of his companies has met with strong criticism and may not prove of benefit, but there seems little doubt that manufacturers are apt to frame their buying policy to some considerable extent upon the facts and figures specifically mentioned, as also upon others which regularly see the light of day in regard to rubber plantations but are usually hidden under a veil in the case of other commercial concerns.

PRICE OF MOTOR PNEUMATIC TIRES.

Motor car owners are at the present time much exercised in mind with regard to their purchases of tires, as the prices of different firms for what is apparently the same article show considerable variation. In a general way, what I may call the leading group of six or seven makers offer their tires at the same price. Other makers outside this group show considerable difference of price, in both directions. Taking the most common size, 815 mm. x 105 mm. (32" x 4"), as used on 15 H. P. cars, the purchaser has quite a bewildering choice, from the £5 18*s*. Russian Prowodnik tire to the new Moseley plantation rubber tire at £3 18*s*. less a special discount of 10 per cent. during July. Then Harrod's Stores, of London, are offering their Shell tire, which is moderately priced, while the Avon Rubber Co. are asking £4 18*s*. for their 815 mm. x 105 mm. (32" x 4") extra heavy, their ordinary type remaining 15*s*. higher than Moseleys'. Henley's Telegraph Works, which are newcomers into this field, have a rather high-priced tire. I might go on enumerating different makes but I merely wished to make a brief reference to the existing situation. As all the manufacturers give a guarantee of 3,000 to 4,000 miles, motorists are engaged in finding out for themselves if the higher-priced tires are really more economical in the end than those purchasable at a much lower figure, as for instance the Atlas Vanadium puncture proof tire, which is priced at £8, the same figure at which the Prowodnik tire was formerly sold.

MR. W. J. EYRE.

I regret to have to record the death of this gentleman, in his 74th year; and a word or two about his career may be of interest. From early life he was associated with the African rubber trade in Liverpool, and about twenty years ago he conceived the idea of washing dirty rubbers for the trade, thus being a precursor of the Crude Rubber Washing Co. His business premises were near Holywell in North Wales, the site and buildings of a defunct copper works being utilized. A large overshot waterwheel formed the source of power for the washing machines, which at the time of my last visit to the works were being largely augmented. Unlike concerns whose procedure has been to buy rubber outright, wash it and then have to face a falling market on selling, Mr. Eyre's method was to bargain with a customer to take the washed rubber at a price before completing his own purchase. No rubber was of too low a grade or too high a smell for Mr. Eyre to tackle, a certain strong but harmless disinfectant playing a prominent part in the treatment. Mr. Eyre leaves a son who was associated with him in the business.

RECLAIMED RUBBER.

The impending doom which, according to Mr. Maclaren's statements of some months ago, threatened the reclaiming industry, shows no signs yet of materializing. No works have yet been closed down. On the contrary, rubber scrap dealers and reclaimers I have met speak with confidence as to their prospects. Individual reclaimers of course may express the opinion that there are too many in the business, and the competition among selling agents is certainly keen enough, for the number of buyers is very limited. Further competition, I hear, is imminent, as a large American concern hitherto unrepresented in Great Britain has recently established an agency. The works of the Xylos Rubber Co., Limited, at Trafford Park, Manchester, are rapidly approaching completion. These works, as mentioned on a former occasion, are promoted by the Firestone Tire & Rubber Co., of Akron, Ohio, and will operate a patent granted in 1912. It is a modification of the alkali process, the novelty being the use of a small quantity of aniline or other amino compound which acts as a catalytic agent, bringing about the union of both the free and combined sulphur with the caustic alkali. Samples of the product which I have seen are of very high quality.

PAVEA RUBBER.

The general interest in this topic is well sustained, all the more since the appearance in "Truth" of articles under the headings of "The Tipperary Rubber Boom" and "The Synthetic Enigma." Owing to the widespread interest and the attempts which have been made to obtain information surreptitiously, sentries have been posted round the Handforth works night and day. With regard to the offers or challenges which have been made to Mr. Roberts by "Truth," your London contemporary and others, that the complete process should be demonstrated before experts sent by the said challangers, rubber manufacturers say that they see no reason why Mr. Roberts should thus oblige those with whose interests he may come into conflict. It must be remembered that those who made synthetic rubber by

laboratory processes patented each step as they progressed, whereas it is understood that the Pavea rubber is to be produced by a secret unpatented process. Secret processes are continually being evolved in factories of one sort or another, and those associated with them are not commonly called upon to stand and deliver.

I hold no brief for Pavea rubber but am merely trying to put forward a common sense view of the situation which has arisen and which has given rise to considerable comment. A manufacturer who has had the Pavea rubber closely examined in his laboratory states that it differs from Pará rubber in the absence of insoluble matter and in the constitution of the resin. Pavea rubber, despite the fitting up of large works for its production, is not yet upon the market, so it is too soon to see what the plantation producers will do to meet the new competition. I hear, however, that if it is a success the Highlands & Lowlands Co. are prepared to sell their produce at a figure as low as 1*s.* 3*d.* per lb. A fairly large sample of Pavea rubber has attracted a good deal of attention at the Rubber Exhibition, where it was shown by F. R. Muller & Co., the sole selling agents, and it need hardly be said that it has proved a very general topic of discussion.

ENGLISH COMPANIES RECENTLY REGISTERED.

Baker Rim Co., Ltd., 59 Hagley Road, Stourbridge. Capital, £25,000—15,000 "A" and 10,000 "B" shares of £1 each. To acquire inventions belonging to F. W. Baker relating to motor car rims. First directors F. W. Baker, A. Round, E. S. G. Hicks and C. A. Mills.

Fabricless Rubber Products, Ltd., 8 Laurence Pountney Hill, E. C. Capital, £100,000. To acquire the business of the Azulay Syndicate, Ltd. First directors F. R. Hill, F. C. Roles, W. B. Wright and Sir W. H. Porter.

Sewn Rubbers, Ltd., 59 Chiswell street, E. C. Capital, £2,000 in £1 shares. To manufacture and deal in all kinds of motor and other tires. First directors A. T. Collier and F. M. Beck.

Weber Rubber, Ltd. Capital, £1,000 in £1 shares.

BRITISH GROWN RUBBER.

In addressing the Sussex Road (London) Commercial Institute on a recent occasion, Mr. Herbert Wright said that Great Britain should take the lead in technical rubber instruction. British possessions alone contained more than half the total planted acreages under rubber, the balance being largely controlled by companies registered in England. British possessions alone would soon give rubber at 2s. 6d. (60 cents) per pound, valued at £28,000,000 sterling ($140,000,000) per annum. The crop would be ultimately greater than the combined crops from tropical America, Mexico and Africa. He had no doubt that increased supplies of rubber would create improved demand for that product.

THE BYRNE CURING PROCESS.

Mr. F. A. Byrne, director of the Rubber Curing Patents Syndicate, Limited (who has lately been visiting the East), has stated in an interview that the new method obviates the expenses of the installation and upkeep of washing and crêping machines. It has been adopted by a large additional number of estates in the Malayan peninsula and Java, while Ceylon planters have been awaiting Mr. Byrne's personal explanations before taking up the new process on an extended scale.

In his opinion an improvement in the quality of plantation rubber is needed, with the view of securing the large market which awaits it for tires when it is brought up to the standard of fine, hard Pará. Some of the large makers are said to be using plantation rubber for their covers, but not for their inner tubes.

ENGLISH CABLE CONSTRUCTION COMPANIES.

The old adage, "It's an ill wind that blows nobody good," is being exemplified in the case of the English cable construction companies, which have in most cases been enabled through the fall in rubber, to pay increased dividends, while carrying over larger balances than a year ago to new account.

A comparison of the dividends paid for the two years by eight companies gives the following results:

	Ordinary dividend,	
	1912-13.	1913-14.
Anchor Cable .....*per cent.*	15	15
British Insulated & Helsby Cables.....	10	13
Ericson Manufacturing	8	8
Callenders Cable & Construction.....	15	15
Craigpark Electric Cable.....	5	6
W. T. Glover & Co.....	7½	7½
W. T. Henley Co.....	15	20
Telegraph Construction & Maintenance.....	20	20

An increase of about $400,000 is represented by the amounts carried forward to new account by the above eight companies for 1913-14, as compared with 1912-13.

Cheap rubber is a boon to the cable manufacturing industry, however badly it may hit investors in plantation shares.

ENGLISH CONSUMPTION.

Of the 31,000 tons of rubber imported by England in the five months ending with May, 1914, no less than 24,000 tons were re-exported, leaving only 7,000 tons for home consumption, or little more than half the amount for the corresponding time last year. English manufacturers were thus apparently prepared to let their stocks become depleted, while the foreigner took as much cheap rubber as he liked.

GERMAN MANUFACTURING STATISTICS.

The eighth annual census of German manufacturers shows the total earnings of the nine principal tire manufacturing concerns operating in that country to have amounted in the past eight years to $16,332,288—a yearly average of $2,041,536—on a capital investment of $10,675,000. Of this amount the Continental company (the largest of the nine companies) realized earnings amounting to $9,904,285—a yearly average of $1,238,036—on a capital of $3,750,000, representing an average yearly dividend of 42.5 per cent., the largest average for any of the companies; while five of these nine largest concerns have lost in the eight-year period a total of $2,011,719.

Statistics also show that on January 1 of this year there were in the German Empire 70,515 motor vehicles—an increase of 59,443 over the number recorded when the first census was taken in January, 1907—also 22,457 motorcycles.

TURKEY'S COMMERCE IN RUBBER.

Statistics covering the commerce of Turkey show the imports of rubber and gutta percha goods during the year 1911-12 to have amounted to $954,521, divided between: Rubber overshoes, $454,349; raincoats, $138,421, and all other rubber goods, $361,751. Of these imports the United Empire supplied rubber goods to the value of $479,656, Austria Hungary $261,109 and the United States $192,179. The quality of the rubber goods received from the United States is said to have been unsatisfactory to the Turkish trade, but there seems to be no reason why American goods might not regain favor in that country if the quality is improved.

Turkey's exports of rubber and gutta percha goods in the year 1911-12 were valued at $59,403, and the exports of old rubber to the United States amounted in 1912 to $64,790, in the year 1913 to $51,769.

RUBBER NOTES FROM JAPAN.

By Our Regular Correspondent.

THE LONDON EXHIBITION.

JAPAN contributed two exhibits of rubber goods to the London Exhibition, which were respectively from the Rato Co., of Asakusa, Tokio, and the Nakajima Co., of Honjo, Tokio. The special feature of the former was the "Shield" (or protective) tire, by which friction is avoided, while the latter mainly consisted of plain and printed rubberized silk (Habutae). It included a "Patent Life-Preserver of Rubber Fabric," as well as air pillows and other articles which the company is in a position to manufacture on a large scale.

NEW JAPANESE RUBBER COMPANIES.

The present year has witnessed the establishment of several new Japanese rubber companies. Among the most prominent is the Kyokuto Rubber Co., incorporated April, 1914, with an authorized capital of $75,000, one-fourth of which has been paid up. Its products are bicycle and solid tires, water-pillows, etc. After the removal of the Watanabe Works, its premises were purchased by the newly established Fukagawa Rubber Works, of Tokio. Rubber heels and gas tubing form the principal manufactures of this last-named company.

Since last autumn the Nihon Rubber Works has been arranging to extend its line beyond medical specialties, so as to include tires, toy balloons and rubber cement. Last spring the Kobe Rubber Co. sold out to its selling agents, its products being bicycle tires, tubings and other rubber goods. The staff now includes U. Inokuchi, a chemical manufacturer, as consulting chemist. In May last, the Ebisa Rubber Co. was established at Tokio for the manufacture of waterproof fabrics. This company's Osaka works, which have been making rubber hand balls, now contemplate the addition of bicycle tires.

RUBBER EXHIBITS AT THE "TAISHO" EXHIBITION.

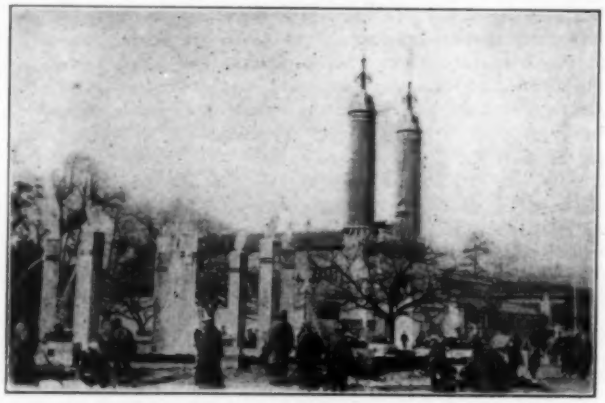
The "Taisho" exhibition opened at Uyeno Park, Tokio, in the spring of this year represents a capital of $800,000, being intended to promote the development of Japanese commerce and industry, in connection with the Imperial accession ceremonies. With a total area of 82 acres, and with buildings covering 468,000

THE MACHINERY BUILDING.

square feet, the 200,000 exhibitors have an excellent opportunity for the display of their products, while the fourteen divisions include a full representation of modern arts and industries. Special structures are devoted to Industry, Transport, Fine Arts, Forestry, Corea, Saghalien, Formosa, South Seas and other subjects. The president is His Imperial Highness Prince Kanin, and the director-in-chief is the Governor of the Prefecture of Tokio.

The rubber exhibits are broadly divided into those respectively affecting production and consumption, the former being grouped in the "South Sea" building, by which generic name the Chinese and Japanese call Siam, the Malay Peninsula, Java, Borneo, Celebes, Sumatra, etc. In 17 large photographs are to be seen the processes of making plantation rubber, while the exhibits include many grades of crude rubber, tapping knives and cups, rubber plantation tools and other appliances.

Exhibits of rubber manufactures are displayed in various of the special buildings, a prominent position being occupied by



THE INDUSTRY BUILDING.

the Dunlop Rubber Co. (Far East), Limited, of Wakinohama, Kobe. This company (a branch of the English one) claims to be making the best tires in Japan, and to be filling a large part of the demand. Its exhibit includes automobile tires and tubes, solid tires, bicycle tires, suction hose, packings, rubber heels, etc.

Jinrikishas with pneumatic tires are shown by about a dozen Tokio makers, while a large number of exhibitors display motor cars and bicycles constructed in Japan.

Among various other exhibits of rubber manufacture are the following:

Meiji Rubber Works, Tokio.—Electric workers' gloves, rubber rolls for paper mills, rubber hose, ebonite.

Nihon Kautchuk Works, Tokio.—Spraying hose and repairing compounds.

Ida Rubber Co., Tokio.—Tubing and hose.

Nipon Rubber Co., Ltd., Tokio.—Tires for military automobile transport.

Mitatsuchi Rubber Manufacturing Co., Tokio.—Ebonite bars, tubes, plates and insulating materials.

A large variety of rubber goods and druggists' specialties is displayed by other leading Japanese exhibitors, some two dozen or more in number.

In the "Foreign Building" the Japanese agents of various leading European automobile makers have specimens of their cars, the tires being of Goodrich, Firestone, Continental, Michelin and other makes.

THE GOODRICH EXHIBIT.

The B. F. Goodrich Co. is the largest rubber goods exhibitor, occupying a space of nearly 7,200 square feet, its lines forming an interesting display for the rubber trade of the world. Included in the exhibit are all varieties of tires, repair outfits, hose of various kinds, packings and a large assortment of sundries, the total number of items being about 80.

This comprehensive exhibit is a striking example of what such an enterprising firm can do to bring its products before the attention of foreign buyers in the face of such keen competition as exists apparently in the Japanese market.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE BATAVIA RUBBER EXHIBITION.

PRIZES AND DISTINCTIONS TO BE AWARDED.

IN addition to certificates of honorable mention, the following special prizes will be awarded at the above exhibition, which opens on September 8:

I. Prize. Most complete description of housing and hygienic regulations for coolies on rubber estates. By Governor General of Netherlands Indies.

II. Batavia 1914 Cup—Value equaling $200 gold. For best collection showing cultivation of *Hevea Brasiliensis*. By daily administration.

III. Soerabaya Handelsblad Cup—Value equaling $180 gold. For exhibit from Netherlands Indies, connected with cultivation of *Hevea Brasiliensis*. By M. van Geuns, chief editor.

IV. Van Laer Cup—Value equaling $120 gold. For best commercial sample of Malayan *Hevea* rubber. By A. van Laer.

V. The-Lowest-Cost-of-Production Cup—Value equaling $144 gold. For lowest cost of production on a Java estate, f. o. b. Tandjong, Priok. By F. Peck & Co., Bandoeng.

VI. The Ottolander Cup—Value equaling $200 gold. For best sample of commercial Ceara rubber. By T. Ottolander, president of the Netherlands Indies Agricultural Syndicate, Banjoewangi.

VII. F. M. S. Trophy—Value equaling $96 gold. For best sample of commercial *Hevea* rubber produced upon any estate in the Netherlands Indies. By Grenier's Rubber News, Kuala Lumpur.

VIII. The Ceylon Cup—Value equaling $96 gold. For commercial sample of Smoked Plantation Rubber, produced in Ceylon, approaching as near as possible to Fine Hard Pará. By N. C. S. Bosanquet.

IX. Gold medal. For the most complete exhibit of machinery used on rubber estates. By the West Java Rubber Planters' Association.

X. Planters' Association of Malaya Cup—Value equaling $240 gold. For every exhibit of plantation Pará (in lots of not less than 100 pounds) which attains the highest standard on basis of proposed R. G. A. tests. By Planters' Association of Malaya, Kuala Lumpur.

XI, XII and XIII. Gold, silver and bronze medals. For three best commercial samples of Smoked Sheet. By Rubber Growers' Association, London.

XIV. THE INDIA RUBBER WORLD Cup. For most complete exhibit of wild rubber. By Henry C. Pearson, editor.

CONGRESS OF RUBBER COUNTRY PHYSICIANS AT BATAVIA.

During the rubber congress to be held at Batavia, Java, from September 7 to September 12, there will also be held a congress of physicians from rubber countries. About fifty doctors have already expressed their intention of taking part in this congress, which is being organized by Dr. Kiewiet de Jonge.

PARTICIPANTS IN THE JAVA EXHIBITION.

According to latest reports, the countries taking part in the exhibition will include: England, Holland, Malay States, British India, Ceylon, Straits Settlements, Siam, Australia, Belgium, Germany and Italy. Replies had not at that time been received from Japan, Sweden, Denmark and Austria.

BATAVIA PLANTATION INVESTMENTS, LIMITED.

At the recent second annual general meeting of the above company, a final dividend of 7½ per cent. was declared; making a total of 15 per cent. for the year. This corporation, with a capital equaling $1,000,000 (nine-tenths of which is fully paid up), has apparently been making satisfactory profits on its investments in the shares of various Dutch East Indian companies, without incurring new liabilities, and meeting all current expenses out of revenue. The three estates controlled are the "Kweeklust" and "Weltenvreden" of Java, and the "Eerste Medansche" of Sumatra, to which it is contemplated to add others. The total output of the three was about 300,000 pounds, produced at a reduced cost of 1*s.* (24.33 cents) per pound.

A fourth estate has recently been added to the company's holdings, the "Broadwater," Perak (Federated Malay States), of 1,000 acres, of which 370 acres have been planted since 1910. Some 3,000 trees are said to be now fit for tapping.

In explanation of the relatively favorable prices obtained last year, the chairman stated that the company sold its product in the East, thereby saving the freight to London and the charges at that port, adding:

"There is an increasing number of American buyers, who prefer to purchase their rubber direct from the estates in the East and to ship it to New York, rather than buy in London. . . . The percentage of the output of rubber sold in London is steadily decreasing and . . . will decrease still further."

RUBBER IN GERMAN EAST AFRICA.

The British Consul at Dar-es-Salaam reports that the setback in the economic development of the colony produced by the fall in rubber has been of a serious character. Rubber cultivation is one of the most important interests, there being probably some 19,000,000 trees planted in the colony, of which about one-half are ready for tapping. All plantations have limited the number of hands employed, and two of the largest have entirely suspended tapping. In order to partially meet the situation, railway and ocean freights have been reduced.

Prospects of the smaller estates are better than those of the larger ones, the working expenses being less. Some of the latter are said to have begun to cut down rubber trees to make room for other crops.

Another difficulty with which planters have had to contend is the absence of a standard quality for East African rubber. There is only one large washing and curing factory in operation, at Muhesa, while several smaller ones are at Usambara. Most of the planters wash the rubber themselves, with the result that it has to be done again in Europe.

BELGIUM'S CONGO COLONY.

A recent issue of a journal published in Liège, Belgium, contained a very interesting contribution on the situation in the Belgian Congo country by Georges Lorand, who, it will be remembered, took such an active part in bringing about reforms in that country, and doing away with the frightful atrocities that went on under the Leopold regime.

Mr. Lorand is not at all optimistic regarding the future of this colony. He cites the fact that the finances of the colony have shown a deficit for a number of years, which at the present time amounts to £6,000,000. He states that the horrors that took place in the days of Leopold have ceased, but that owing to the fact that labor is no longer under compulsion as it was in those days, and owing to the increasing competition of plantation rubber, which has brought prices down to a very low figure, the shipment of rubber from that colony has practically ceased. One phase of the situation to which he calls attention is the fact that not a little of this plantation competition may be attributed to the Belgians themselves, as the Belgian companies now operating in Malaya have an aggregate capitalization of £10,000,000, and are thus quite an important factor in the lowering of rubber prices generally and the practical extinction of the Congo rubber trade. Mr. Lorand further states that there is no cultivation of any sort at the present time in the Congo, and that while much is said about the mining possibilities of the colony, the cost of the necessary railroads would be in the neighborhood of £28,000,000. He concludes by the assertion that if through the exhaustion of home resources the Congo should ever be put on a profitable footing the colony would probably be taken away from the Belgians altogether.

Exports of Balata from Java amounted in 1913 to 2,614,506 pounds, an advance of 1,010,849 pounds over the 1912 exports.

NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent.

ALTHOUGH the plantation rubber industry in this colony has not up to the preesnt made very great progress, its possibilities are undoubted. From time to time the Government publishes exhaustive reports with a view to demonstrating how great those possibilities are. Such a report by the Assistant Director of Science and Agriculture, Mr. C. K. Bancroft, has just been published. Its value lies in the fact that it brings all the statistics up to date, that it is exceedingly optimistic, and that Mr. Bancroft, by reason of his long experience in the Federated Malay States, can speak with considerable authority. Mr. Bancroft arrives at the following conclusion:

"There are two primary factors which operate in the cultivation of Para rubber, viz., the cost of bringing areas to maturity and the future cost of production per pound of rubber.

"That the former can be effected in this country, so as to compare not unfavorably with other parts of the world, there appear to be sufficient data in the above report to indicate. With respect to the latter there are no actual data available from which to judge. Figures at my disposal indicate that the cost of production will not be heavy. The low cost of supervision, as compared with other rubber growing countries, and the health of the labor force, are factors which are in favor of a reasonable cost of production of rubber in the colony."

Mr. Bancroft does not think that the cost can ever be as low as 16 cents per pound, "the cost estimated for some of the better plantations in Sumatra, and the lowest which has to my knowledge yet been given in any part of the world," but he thinks that with a market price for the raw product of 48 cents per pound, Para rubber can be cultivated at a fair profit in this colony under proper supervision.

HOW THE EXTENSION OF THE INDUSTRY MAY BE EFFECTED.

Mr. Bancroft goes on to say that the extension of the rubber industry in this colony may be effected in two ways: 1, by the utilization of local capital; 2, by the introduction of foreign capital.

"The former is more likely to operate in the direction of the conversion of previously existing cultivations into rubber cultivations. The latter may be utilized in this way or may be directed towards an extension of the area under cultivation in the colony, viz., the conversion of original forest into rubber cultivations. The conversion of existing areas of sugar into rubber has been extensively employed in North Perak, and Province Wellesley (Malay Peninsula) is receiving attention by one private firm. The employment of foreign capital to convert a previously existing cultivation of coffee, cacao and fruit trees into a rubber cultivation is in operation on one property. These enterprises must be watched with considerable interest."

COST OF ESTABLISHING AN ESTATE.

Mr. Bancroft estimates the cost of opening up from forest and bringing to maturity one acre of rubber in an estate of 500 acres in the interior of the colony, at $151, as follows: Application and registration fees and survey, 35 cents; underbrushing, felling, etc., $12; burning, restacking and burning, clearing, $15; lining and holing, $7; planting, $2; cost of plants, $2.50; roads, $5; weeding, 1st year, $20, 2nd year, $12, 3rd year, $10, 4th year, $7, 5th year, $6; superintendence, $35; building manager's and two overseers' quarters, ranges for coolies, $15; contingencies, $2.15—a total of $151 exclusive of factories, or $175 inclusive of factories. On the low lying lands an item of $15 per acre has to be included for drainage.

RAINFALL STATISTICS.

The mean annual rainfall taken at 24 recording stations near the coast, during the year was 84.4 inches for the County of Berbice, 102.08 inches for the County of Essequibo, and 98.37 inches for the County of Demerara. The mean annual rainfall for 18 districts away from the coast for 1911 was 108.93 inches. The distribution of the rainfall in this colony is such as is favorable to the growth of the plant, more particularly in the interior of the colony and on the lands situated some distance from the coast.

SOIL CONDITIONS.

The interior lands are thus better served by rainfall than the coast lands. So are they from the point of view of soil conditions.

The different soils on which the plant is being cultivated may be roughly divided as follows: 1—The heavy clay soils of the front lands. 2—Those further back and on the banks of the rivers, of a looser texture and usually having surface layers rich in organic matter, overlying a clay subsoil. 3—The orange to red laterite soils away from the coast, comprising undulating lands and possessing layers of various depths.

British Guiana lies within what may be termed the rubber zone and is adjacent to the home of the Para rubber plant. By selection, areas can be obtained which comprise soils resembling closely those on which the plant is cultivated in the East.

COST OF LABOR.

Mr. Bancroft points out that the cost of labor is higher than in the East, but he thinks it is more efficient. The labor is both negro and East Indian, and the wages vary from 32 cents to 45 cents a day for men, from 20 to 25 cents for women, and from 12 to 16 cents a day for children, but the usual working day in this colony is 10 hours, as compared with 9 (8 being the usual time of employment) in the Malay Peninsula. "A sufficient supply for the maintenance and extension of the areas at present under cultivation appears to exist. It is doubtful, however, that a large extension of the present industry could be undertaken without drawing labor from other industries or from foreign countries."

TAPPING RESULTS.

Experimental tapping has been conducted at various stations which cover a large area of the colony and comprise all classes of soils on which the plant is being cultivated in the colony, except the heavy front clay lands. "At Onderneeming a yield of about 4 pounds of dry rubber per tree is being maintained; at the Hills Estate the average for a tree in nine months is 1 pound, 12½ ounces. Three hundred and seventy-nine trees are now being tapped daily and the cost of collection of 111 pounds, 8 ounces, 14 drams of rubber during the month of January is given at about 20 cents per pound of dry rubber. Two men were employed, where under proper estate conditions one would be sufficient, and if women and children were employed the cost would be reduced. The cost of transport in the colony is low, while it lies adjacent to the principal market for Para rubber, the United States, and direct shipment could be effected to that country. The freight charges for rubber to New York amount to only $4 a ton."

CONCLUSION.

Mr. Bancroft's final conclusion is that "it is probable that the establishment of rubber plantations by manufacturers of prepared rubber goods will at some future time be taken up on a larger scale than has hitherto been done, more particularly if the quality of plantation rubber can be made to approximate more closely to that of the wild Brazilian product. The proximity of British Guiana to the principal market for rubber, the United States, should offer inducement to the introduction of capital from that country for development of rubber in this colony. For this reason the only existing enterprise of this nature in the colony must be regarded with interest."

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

NOTES FROM PARA.

From an Occasional Correspondent.

PARA'S ARBOR DAY AND THE LATE DR. HUBER.

THE importance of the tree as an element of agricultural progress has been officially recognized by the State of Para in the form of the "Tree Festival," held on June 7 at the Experimental Culture Farm of the Lauro Sodré Institute, about half an hour's distance by rail from the city. The festival was attended by the principal State officials and by representatives of all social classes. Among those present were Dr. Enéas Martins, Governor of the State of Para; Dr. Dionysio Bentes, Intendant of Belem, and Dr. Ferreira Teixeira. Señhor Enéas Pinheiro delivered the official address.

More than twenty trees were then planted, each being associated with the name of the donor and with the objects intended to be perpetuated. The trees were all of practical utility for Brazilian agriculture, and were presented by the Governor, Sra. Martins, Dr. João Barbosa Rodrigues, Jr., delegate of the Association for Brazilian Commercial Expansion, and many others. One tree was given by the director of the farm, Señhor Leopoldo Teixeira, in memory of the late Dr. Huber, to whom various sympathetic allusions were made.

Dr. Huber's share in the development of Para was, moreover, the subject of an address by Dr. Ignacio Moura, at the conclusion of which a portrait of the deceased scientist was unveiled, which was later in the day placed in the Museu Goeldi. A subscription was then opened, applicable to the extension of the Botanic Section of the Museu Goeldi, as a memorial to Dr. Huber. An official visit was made to his grave during the afternoon.

This "Tree Festival," it will be seen, gave Dr. Huber's many Para friends an opportunity which was not available at the time of his death, on February 18, of expressing their sympathy.

STATE AGRICULTURAL INSTRUCTION IN PARA.

At a meeting held under the presidency of Dr. Dionysio Bentes, Intendant of Belem, an association has recently been founded, with the object of promoting agricultural instruction in the State of Para. In addressing those present, Dr. Ferreira Teixeira described the result of such training in the United States and other countries. The provisional board of directors includes Dr. Dionysio Bentes, Dr. Leopoldo Teixeira and Señhor Napoleão de Oliveira. The president is Dr. Ferreira Teixeira and the secretary Dr. Enéas Pinheiro. Deputy Vianna Coutinho has published a number of suggestions for the operation of the new association.

THE PROPOSED INCREASED SUBSIDY FOR AMAZON STEAMERS.

In view of the increased subsidy asked by the Amazon River Steam Navigation Co., the Para Commercial Association has represented the necessity, in order to compete with private lines, of the above-named company reducing its rates to the Upper Acre and other points to a level which would still prove remunerative, without diminishing the frequency of sailings. Seeing that the company enjoys many favors under existing regulations, the proposed additional subsidy is characterized as needless.

PERMANENT EXPOSITIONS OF BRAZILIAN RUBBER.

The Commercial Association of Manaos has addressed a letter to the State Governor, asking him to secure the co-operation of the State of Para and of the Federal government in the establishment of permanent expositions of Brazilian rubber in the centers of consumption. Arrangements are suggested of a nature similar to those existing in Europe for Brazilian coffee. In this way it is hoped to offset the efforts of English plantation companies to promote the sale of rubber from the Far East.

CONGRESS OF CHAMBERS OF COMMERCE.

Dr. José Rodrigues Vieria has been appointed delegate to represent the Commercial Association of Manaos at the International Congress of Chambers of Commerce and Commercial Associations, to be held in Paris next June.

THE BRAZILIAN RUBBER CRISIS.

Discussing in the columns of the "Folha do Norte" the recently issued report of British Consul Michell, of Para, quoted in THE INDIA RUBBER WORLD for July (page 562), Señhor J. Simão da Costa remarks that the constant immigration of satisfactory workers is not to be looked for in a region so full of climatic and natural obstacles. He adds that Brazil could never have attained its present importance as a rubber exporting nation without the co-operation of those intermediaries to whom Consul Michell attributes the high cost of the article.

Moderation has been urged by Brazilian Senators in state and municipal loans, in which it is advised to refrain from taking undue advantage of such credit facilities as may be available.

A deputation of French bankers has had interviews with the Brazilian Minister of Finance, Dr. Rivadavia Corrêa, the result of which is said to have been an understanding that as soon as the operation has been approved by the Brazilian Congress the above-named bankers will advance to Brazil the equivalent of $20,000,000 in gold.

THE USE OF EXPLOSIVES IN AGRICULTURE.

The above topic formed the subject of a paper read by Mr. Harold Hamel Smith, editor of "Tropical Life," at the Third International Rubber Conference. In THE INDIA RUBBER WORLD of April, 1913 (page 352), this paper was reproduced. Since then experiments on the subject have been carried out in Ceylon by Mr. Doolan, Australian representative of Nobel's Explosive Co., Hamburg. While a large number of planters were present, some of them were apparently of the opinion that the ground chosen did not represent the soil in which explosives are chiefly required, being of too loose and deep a character. Mr. H. F. Macmillan, the superintendent, subsequently conducted three other experiments, intended to show the radial effects of dynamite in light and heavy soils, the latter being of a type specially belonging to Ceylon.

Another feature of the experiments was the blasting of stumps under the direction of Mr. Macqueen, a dynamite expert of the Nobel's Explosive Co., Glasgow. This took an equipment costing 75 cents, and required three coolies to work two and a half hours to completely remove the shattered portions and roots.

The blasting of obstructive boulders is one of the most dangerous operations in connection with agricultural explosives, owing to the risk of their exploding. Much can be done to prevent this, however, by covering the boulders with leafy branches.

Mr. Macmillan's pamphlet forms Bulletin No. 8 of the Department of Agriculture, Ceylon, for 1913, and is supplemented by a dozen illustrations showing the various operations and their effects. This pamphlet seems destined to carry this important question a long step forward.

THE WICKHAM PATENT PROCESSES.

Satisfaction has been expressed in Ceylon at the premium of about 35 per cent. at which shares have been changing hands in the company which is working the Wickham patents. In pursuance of his right to nominate one member of the board, Mr. Wickham has chosen Mr. F. Crosbie-Roles, well known on this side of the Atlantic, and editor of the "Times of Ceylon."

The Wickham process is protected throughout the world, and it is estimated that an income of less than $12,500 a year will pay all expenses and will furnish a profit of more than 20 per cent. on the capital issued. A number of planters are shareholders, which is regarded as a favorable sign.

Should be on every rubber man's desk—The Rubber Trade Directory of the World, 1912.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED JUNE 2, 1914.

NO. 1,098,375. Spring tire. H. S. Gover, Bel Air, Md.

1,098,384. Inflatable playground ball. L. T. Hoffman, Philadelphia, Pa., assignor to The Draper & Maynard Co., Plymouth, N. H.

1,098,426. Coupling. A. P. Cochrane, New York, N. Y.

1,098,469. Fountain pen feed. F. W. Bender, Hoboken, N. J.; Pauline Bender, executrix of said F. W. Bender, deceased.

1,098,488. Tire tool. J. W. Dyar, Detroit, Mich.

1,098,492. Back brace. G. W. Gibson, Plumerville, Ark.

1,098,546. Truss pad. J. U. Adams, Cincinnati, Ohio.

1,098,577. Resilient vehicle wheel. S. Johnstone, assignor of three-eighths to J. D. Cornell and two-eighths to S. Canman—all of Sacramento, Cal.

1,098,588. Tire armor. A. L. Powell, assignor of one-fiftieth to H. E. Wolfe—both of Stockton, Cal.

1,098,590. Spring wheel. J. T. Rynda, New Prague, Minn.

1,098,599. Truss. D. Voelpel, Brooklyn, N. Y.

1,098,609. Rubber composition and its production. J. W. Aylsworth, East Orange, N. J., assignor to Halogen Products Co., West Orange, N. J.

1,098,620. Hose connection. H. Gillar, Hoboken, N. J.

1,098,674. Automobile tire pump. C. P. McDowell and R. H. Easter, Porter, Wash.

1,098,677. Pneumatic tire wheel. J. Miskey, Dayton, Ohio.

1,098,752. Hose coupling. C. Olsen, Port Richmond, N. Y.

1,098,759. Resilient wheel. W. R. L. Ray, Fort Jones, Cal., assignor of one-half to M. M. Zelle, Sisson, Cal.

1,098,782. Resilient wheel. S. Craig, Eagle Station, Ky.

1,098,858. Producing chlorin derivatives of the amyl series. F. Webel, Mannheim, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany.

1,098,859. Producing isoprene. F. Webel, Mannheim, Germany, assignor to Badische Anilin & Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany.

1,098,876. Atomizer. O. F. Becker, New York, N. Y.

1,098,882. Manufacture of rubber compounds. L. Collardon, West Bromwich, England.

1,098,919. Machine for forming cable armor. C. T. Pratt, assignor to The Pratt Chuck Co.—both of Frankfort, N. Y.

1,098,967. Process of making insulating material. C. F. Peterson, Schenectady, N. Y., assignor to General Electric Co., of New York, N. Y.

1,098,972. Suction cup for dental plates. H. R. Priest, Loudonville, Ohio.

1,099,028. Nozzle. W. Czarnecki, Philadelphia, Pa.

1,099,056. Apparel corset comprising elastic fabric strips. D. Kops, New York, N. Y.

1,099,062. Electric scalp appliance, comprising a yieldable rubber cap. P. P. Laposkey, Cherokee, Iowa.

1,099,082. Nursing device. W. M. Decker, Buffalo, N. Y.

1,099,107. Process for the manufacture of a substance resembling natural rubber. R. Weissgerber and K. Keller, Duisburg-Meiderich, Germany, assignors to Gesellschaft für Teerverwertung M. B. H., Duisberg-Meiderich, Germany.

1,099,112. Portable vulcanizer. J. S. Benson, Riverside, assignor to Positive Supply Co., Davenport—both in Iowa.

1,099,128. Hose coupling. H. B. Robinson, Muskegon, Mich.

1,099,144. Device for inflating cushions for invalids' beds, chairs or the like. C. Andersen, *geb.* Clausen, Buschau, near Schleswig, Germany.

Designs.

45,891. Tire tread. G. H. Robertson, New York, N. Y.

45,901. Syringe bag. W. D. Yates, Somerville, Mass.

Trade Marks.

60,931. A. O. Meyer, Hamburg, Germany. Bust portrait of man. For leather and rubber boots and shoes.

68,322. J. A. Burgess, Toronto, Canada. The word *Zip*. For tire fillers.

74,499. C. A. Annis, Stoneham, Mass. The word *Rainaway*. For waterproof coats.

76,947. Rosenwald & Weil, Inc., Chicago, Ill. The word *Imperial* with a crown above it. For rubberized fabrics.

77,097. Eagle Pencil Co., New York, N. Y. The word *Caplox*. For fountain pens.

77,676. I. B. Kleinert Rubber Co., New York, N. Y. The word *Handy*. For dress shields.

77,677. I. B. Kleinert Rubber Co., New York, N. Y. The word *Justrite*. For dress shields.

77,678. I. B. Kleinert Rubber Co., New York, N. Y. The word *Juno*. For dress shields.

77,679. I. B. Kleinert Rubber Co., New York, N. Y. The word *Eton*. For dress shields.

77,746. The R. M. Hollingshead Co., Camden, N. J. The word *Whiz*. For cements for rubber, etc.

ISSUED JUNE 9, 1914.

1,099,173. Demountable rim. C. S. Goodfellow, assignor to A. Higson and G. H. Martens—all of Jersey City, N. J.

1,099,219. Wheel comprising a plurality of adjustable tread blocks. A. Walters and G. Hennkens, assignors of one-eighth to T. Albes—all of St. Louis, Mo.

1,099,282. Soft tread tire. J. W. Crusius, Paulding, Ohio.

1,099,336. Composition of matter for filling tires. A. J. Bishop, St. Paul, Minn.

1,099,344. Instrument for writing, marking or decorating with plastic materials. E. B. Desenberg, Kalamazoo, Mich., and E. S. Pilsworth, Battle Creek, Mich.

1,099,454. Tire. F. W. Kremer, Carlstadt, N. J., assignor to United Motors Co., Rutherford, N. J.

1,099,498. Process for manufacturing synthetic isoprene. C. K. F. L. Gross, Christiania, Norway.

1,099,513. Non-skidding device. P. Panchula, Dixonville, Pa.

1,099,535. Wrapping machine. A. C. Bolton, assignor to Gutta Percha & Rubber Manufacturing Co.—both of New York, N. Y.

1,099,551. Sole cementing machine. I. L. Keith, Haverhill, Mass.

1,099,671. Bath mat. G. W. Smith and W. W. Becker—both of Buffalo, N. Y.

1,099,722. Spring tire. C. Scheuner, Chicago, Ill.

1,099,728. Spring wheel. C. W. Whaland, Chestertown, Md.

1,099,760. Fountain syringe attachment. H. F. Ong, Portland, Ore.

1,099,763. Rubber faced belting, and process of making the same. R. Parker, New York, N. Y., assignor to Parker, Stearns & Co., Brooklyn, N. Y.

1,099,796. Top for cloth or flexible water bags. R. S. Gutshall, Denver, Col.

1,099,798. Storm top for buggies. G. H. Harper, Columbia City, Ind.

1,099,814. Diving apparatus. E. Niehoff, assignor to Roanoke Wrecking & Salvage Co., Inc.—both of Roanoke, Va.

Design.

45,918. Bathing cap. J. P. Schan, Brooklyn, N. Y.

Trade Marks.

37,028. C. A. Daniel, Philadelphia, Pa. The letter *D*. For composite rod packing made of rubber fabric and soft fibrous wicking.

72,191. J. M. Munyon, Jr., Philadelphia, Pa., and New York, N. Y. The word *Lastire*. For preservative of rubber products.

76,147. The Mansfield Tire & Rubber Co., Mansfield, Ohio. The word *Packard*, with particular arrangement of letters. For rubber automobile and vehicle tires.

76,698. Lee Tire & Rubber Co., Whitemarsh township, Montgomery county, Pa. The word *"Vanadium."* For rubber tires, etc.

77,217. Rogers Peet Co., New York, N. Y. The word *"Gymkhana."* For men's and boys' clothing, including raincoats.

77,468. J. Adler, Baltimore, Md. A design, of which the letter *A* forms the center. For men's and boys' raincoats, overcoats, etc.

78,170. The London Waterproof Co., New York, N. Y. The word *Keaprite*. For raincoats and overcoats.

ISSUED JUNE 16, 1914.

1,099,939. Non-skid device. J. Sadus, Filbert, W. Va.

1,100,002. Head for insulating machines. C. L. Van Ness, Akron, Ohio.

1,100,025. Combined comb and cleaner. J. M. Morin, Ben Lomond, Cal.

1,100,027. Wheel. J. Putter, St. Joseph, Mo.

1,100,030. Padded horseshoe. C. E. Sheldon, assignor to The Whitman & Barnes Manufacturing Co.—both of Akron, Ohio.

1,100,032. Tire tool. C. E. Speck, St. Marys, Ohio.

1,100,039. Tensioning device. W. C. Tyler and E. Nall, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.

1,100,040. Resilient wheel. C. H. Weiskopf, Jr., Los Angeles, Cal.

1,100,133. Spring cushioned wheel. S. C. Hoen, assignor of one-half to A. Ahlberg—both of St. Paul, Minn.

1,100,137. Spring wheel. E. F. Krell, Detroit, Mich.

1,100,156. Corset comprising intertwined elastic straps. M. G. Southworth, Fayetteville, Ark.

1,100,242. Spring wheel. J. C. Howells, Renton, Wash.

1,100,282. Tire trunk. J. Berg, New York, N. Y.

1,100,311. Anti-skidding device. J. W. Leasure, Bradford, Pa.

1,100,319. Rubber shoe of the Oxford type. H. Moore, New York, N. Y.

1,100,406. Vanner belt. W. W. Spadone, assignor to Gutta Percha & Rubber Manufacturing Co.—both of New York, N. Y.

1,100,450. Diaper cover. A. H. Stern, assignor to Stern Specialty Co.—both of New York, N. Y.

1,100,451. Tire bead making machine. W. C. Stevens, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.

1,100,459. Felt hat making machine which comprises an india rubber pad. A. Turner and T. Robinson, Denton, Manchester, England.

1,100,472. Demountable rim for pneumatic tires. W. E. Copithorn, Natick, Mass.

1,100,534. Tire fastening means for vehicle wheels. J. L. Cecil, Tippecanoe, Ohio.

1,100,654. Concentrator belt. R. N. Church, Spokane, Wash., assignor to The Republic Rubber Co., Youngstown, Ohio.

1,100,670. Hoof pad comprising a rubber pad member. J. H. Curley, Brockton, Mass.

Designs.

45,925. Confection or chewing gum tablet. C. A. Crane, Cleveland, Ohio, assignor to E. J. Noble, New York, N. Y.

45,932. Tread surface of tire. H. P. Hansen, assignor to Chicago Cycle Supply Co.—both of Chicago, Ill.

45,933. Tread surface of tire. H. P. Hansen, assignor to Chicago Cycle Supply Co.—both of Chicago, Ill.

45,943. Tire pump. C. W. Manzel, assignor to Manzel Bros. Co.—both of Buffalo, N. Y.

45,962. Rectal dilator. D. Rhodes, Washington, D. C.

45,974. Air pump casing. J. K. Stewart, assignor to Stewart-Warner Speedometer Corp.—both of Chicago, Ill.

45,975. Rubber bag for hat brim press machine. W. E. Turner, assignor to Turner, Atherton & Co., Ltd.—both of Denton, near Manchester, England.

Trade Marks.

69,229. Hudson & Thurber Co., Minneapolis, Minn. The word *Hermil.* For rubber belting, hose and packing.

74,597. The Texas Co., Port Arthur, Tex. The letter *T* in the center of a five-point star. For asphaltum, waterproof roofing, saturated felt, etc.

76,941. Live Air Co., Oakland, Cal. The words *Live air.* For puncture proofing substances.

77,494. The Resilia Corporation, San Francisco, Cal. The word *Resilia,* surrounded by a rectangular border. For cleaning and softening rubber products.

77,535. I. B. Kleinert Rubber Co., New York, N. Y. The word *Fairy.* For baby pants.

78,081. I. B. Kleinert Rubber Co., New York, N. Y. The word *Flexo.* For dress shields.

78,082. I. B. Kleinert Rubber Co., New York, N. Y. The word *Crystal.* For dress shields.

78,083. I. B. Kleinert Rubber Co., New York, N. Y. The word *Gloria.* For dress shields.

78,084. I. B. Kleinert Rubber Co., New York, N. Y. The word *Brassiere.* For dress shields.

78,085. I. B. Kleinert Rubber Co., New York, N. Y. The word *Farcoola,* with an outspread fan as a background. For dress shields.

78,221. I. B. Kleinert Rubber Co., New York, N. Y. The word *Kimono.* For dress shields.

78,312. Phillips' Patents, Ltd., London, England. The word *Rubberets.* For rubber heel pads and tips for boots and shoes.

78,384. J. Einstein, Inc., New York, N. Y. A conventional design which embraces the word *Velastra.* For elastic textiles and shoe uppers.

ISSUED JUNE 23, 1914.

1,100,712. Tire for vehicles. R. B. Calcutt, Chicago, Ill.

1,100,719. Demountable rim. S. C. Eddy, Kalamazoo, Mich.

1,100,726. Pneumatic tire. H. B. Gillette, assignor to The Peninsula Tire & Rubber Co.—both of Grand Rapids, Mich.

1,100,758. Boot or shoe having an elastic gore. D. McAuslin, Dunedin, New Zealand.

1,100,768. Mixing machine for india rubber and similar compositions. A. Olier, assignor to Société A. Olier & Cie.—both of Clermont-Ferrand, France.

1,100,778. Fountain pen. K. Räuchle, Hennef-on-the-Sieg, Germany.

1,100,810. Tire. H. Wood, Philadelphia, Pa.

1,100,815. Vehicle wheel rim. J. A. Anglada, New York, N. Y., assignor to Universal Rim Co., Chicago, Ill.

1,100,816. Demountable rim for automobile wheels. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,100,829. Hose construction. J. F. Joseph, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,100,861. Vehicle wheel rim. J. A. Anglada, New York, N. Y., assignor to Universal Rim Co., Chicago, Ill.

1,100,875. Demountable rim. L. J. D. Healy, New Britain, Conn.

1,100,934. Vulcanizing press. J. K. Williams, assignor to The Williams Foundry Machine Co.—both of Akron, Ohio.

1,100,950. Tire armor. M. J. Broderick, Philadelphia, Pa.

1,100,963. Lawn sprinkling device. W. C. Eickman, Dayton, Ohio.

1,101,053. Molding machine for rubber compound. W. L. Bland and O. Bland, Chicago, Ill.; said W. L. Bland assignor to said O. Bland.

1,101,065. Combination clothes brush. C. G. Davis, Manistee, Mich., assignor to C. G. Davis Co., Lomax, Ill.

1,101,082. Spring wheel. C. Kuhn and G. Zahn, Rochester, N. Y.

1,101,103. Method of making straight side tires. W. C. Stevens, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.

1,101,112. Elastic connecting device. M. Albertz, Cologne, Germany.

1,101,195. Spring wheel. S. T. Kronenberg, assignor of fifty-five one-hundredths to J. C. Wolfram—both of Pittsburgh, Pa.

1,101,198. Tire grip. W. B. Lashar, assignor to Weed Chain Tire Grip Co.—both of Bridgeport, Conn.

1,101,281. Insulating coating and method of forming and applying the same. H. B. Holmes, Park Ridge, and J. W. Harris, Wilmette, Ill., assignors to Western Electric Co.

1,101,293. Spring wheel. J. Kunkel, Brookville, Ind.

1,101,386. Demountable rim for automobile wheels. E. K. Baker, assignor to Universal Rim Co.—both of Chicago, Ill.

1,101,406. Mileage recorder for pneumatic tires. C. L. Clise, Berkeley, Cal., and R. Morgeneier, Oakland, Cal.

1,101,457. Auxiliary tire attachment. C. E. Legge, Johannesburg, Transvaal, South Africa.

1,101,487. A boot or shoe sole, comprising rubber-impregnated felt. R. T. Elwell, Trenton, N. J.

Trade Marks.

71,065. Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn. A four-leaf clover design, with the letters *G. R. R. C.* and the words *Eureka clover leaf* enclosed between concentric circles. For rubber boots and shoes.

77,387. Noyes Comb Co., Binghamton, N. Y. The word *Tiger* above a drawing of a tiger's head. For toilet combs.

77,652. Kabo Corset Co., Chicago, Ill. The word *"Com-fit."* For garters and arm bands.

ISSUED JUNE 30, 1914.

1,101,555. Wrapping and unwrapping machine. C. Kuentzel, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.

1,101,680. Spring wheel. C. V. Brandt, Richmond, Va.

1,101,702. Spring tire. H. M. Lakoff, Philadelphia, Pa.

1,101,708. Means for inflating pneumatic tires of motor cars and other vehicles. N. A. Nielson, Marton, New Zealand, assignor of one-half to W. S. Marshall, Mangaraupi, New Zealand.

1,101,732. Molding and vulcanizing machine. H. J. Doughty, Edgewood, R. I., assignor to Doughty Tire Co., Portland, Me.

1,101,741. Demountable wheel rim. C. G. Hawley and E. K. Baker, assignors to Universal Rim Co.—all of Chicago, Ill.

1,101,756. Fireman's face mask. J. Nesvadra, assignor of one-third to S. Krna—both of Binghamton, N. Y.

1,101,828. Vehicle tire. G. V. Baillard, New York, N. Y.

1,101,881. Resilient wheel. W. S. Rait, Chicago, Ill.

1,101,930. Pneumatic tire. H. F. Heycock, Martinborough, New Zealand.

1,101,959. Fountain pen. C. J. Renz, New York, N. Y.

1,101,973. Breast pump. C. A. Tatum, assignor to Whitall Tatum Co.—both of New York, N. Y.

1,101,984. Hose reel. W. M. Barret, Shreveport, La.

1,102,017. Repair device for pneumatic tires, etc. T. C. Dobbins, Los Angeles, Cal., assignor to Weed Chain Tire Grip Co., New York, N. Y.

1,102,061. Repair patch for pneumatic tires. V. P. Le Roy, Newburgh, N. Y.

1,102,084. Tire protector. M. T. K. Rosenow, Metuchen, N. J.

1,102,103. Anti-skidding device for vehicle wheels. H. J. Steigerwald, Auburn, N. Y.

1,102,109. Guard for calendering machines. J. B. Wagg and J. A. Johnson, assignors of one-third to W. L. Wagg—all of Appleton, Wis.

1,102,178. Apparatus for heating coated fabric. W. B. Westcott and E. W. Westcott, assignors to Walpole Shoe Supply Co.—all of Boston, Mass.

Design.

46,035. Wheel. J. E. Strietelmeier, Cincinnati, Ohio.

Trade Marks.

64,959. A. Stein & Co., Chicago, Ill. Picture of child and dog tugging at a garter. For hose supporters.

67,690. Hudson Mechanical Rubber Co., Trenton, N. J. The word and numerals *"Hudson* 600." For a composition used in making washers, etc.

74,999. The Continental Supply Co., Youngstown, Ohio. The words *Severe service* in a rectangular space across a circular drawing. For power transmission and conveyor belts.

75,558. True-Fit Waterproof Co., Inc., New York, N. Y. The words *True-fit brand waterproof* enclosed in ornamental border. For raincoats, etc.

77,119. The De Vilbiss Manufacturing Co., Toledo, Ohio. The word *Oblo.* For rubber bulbs.

77,271. Essex Rubber Co., Trenton, N. J. The word *Servisol.* For rubber sheet packing and round gasket tubing.

77,272. Essex Rubber Co., Trenton, N. J. The word *Pacrite.* For fibrous sheet packing.

77,273. Essex Rubber Co., Trenton, N. J. The word *Spyrisol.* For rubber and duck packing.

77,274. Essex Rubber Co., Trenton, N. J. The word *Valrex*. For asbestos packing.

77,276. Essex Rubber Co., Trenton, N. J. The word *Oakelite*. For rubber sheet packing.

77,277. Essex Rubber Co., Trenton, N. J. The word *Heatris*. For asbestos sheet packing.

77,278. Essex Rubber Co., Trenton, N. J. The word *Motor*. For asbestos sheet packing.

77,279. Essex Rubber Co., Trenton, N. J. The word *Execo*. For rubber sheet packing and tubing.

77,437. Earle & Lyon, Salt Lake City, Utah. The word *Oro*. For bandages, belts, elastic stockings, etc.

77,950. S. Cupples Wooden Ware Co., St. Louis, Mo. The word *Arrow* and drawing of an arrow piercing the letters *S C*. For fruit jar rings.

77,993. Warner-Quinlan Asphalt Co., Syracuse, N. Y. Illustration of Indian in war costume, with spear and shield. For asphaltum.

78,039. Texas Gum Co., Temple, Tex. The word *Mello-mint*. For chewing gum.

78,226. Apsley Rubber Co., Hudson, Mass. Illustration of a boot, with a band around the leg near the top. For rubber boots and shoes.

78,282. Noyes Comb Co., Binghamton, N. Y. The word *Beaver* above illustration of the animal. For toilet combs.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.)

**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 4, 1914.]

3,350 (1913). Tool for tapping rubber trees. Central Tool Works, St. Mary's Row, Birmingham.

3,386 (1913). Garden hose supports. F. W. Haines, Willandra, Manning Road, East Malvern, Victoria, Australia.

3,435 (1913). Rubber attachment for insertion in a helmet for lessening the force of a blow. J. Ayres, 28 Lexington street, London, W.

3,488 (1913). Tread bands for wheel tires. J. E. Fargher, Fire Station, Stanley street, Bury, Lancashire.

3,489 (1913). Wheel tires. J. Cairns, 27 Payne avenue, Hove, Brighton.

3,531 (1913). Probes, cannulas, bougies, drainage tubes and like instruments constructed of india rubber. L. M. C. Charnaux, 4 Rue Lucas, Vichy, Allier, France.

3,619 (1913). Suspenders for socks, etc. Walker Garter Co. and H. W. Taylor, 30 Graham street, St. Paul's, Birmingham.

3,707 (1913). Coagulating latex. E. J. Byrne, Norwich Union Buildings, St. James street, London.

3,718 (1913). Wheel tires. G. W. Beldam, Boston Lodge, Ealing, London, and A. U. B. Ryal, "Granville," Windmill Road, Brentford, Middlesex.

3,798 (1913). Combined gaiter and goloshe. A. O. Rowbotham, "Merrivale," Hulmes Road, Clayton Bridge, near Manchester.

3,904 (1913). An elastic body or core for use in an outer tire cover of ordinary construction. A. Witzel, 45 Wilhelmstrasse, Ludwigsburg, and A. Federer, 19 Büchsenstrasse, Stuttgart —both in Wurtemburg, Germany.

3,927 (1913). Spring wheels. S. Brown, 40 Whitecross street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 10, 1914.]

3,948 (1913). Filter for gaseous fluids, comprising an elastic pad. O. Happel, 33 Wrangelstrasse, Bochum, Westphalia, Germany.

4,029 (1913). Spring wheel with continuous outer rigid ring and pneumatic cushions. G. Cialente, 38 Via Magenta, Rome.

4,056 (1913). Rubber grip for billiard cue. M. Brooser, 2 Wesselcynerater, Budapest.

*4,114 (1913). Solid rubber tread member for vehicle wheels. C. D. Galvin, 33 Cove Road, Merchantville, N. J., U. S. A.

*4,195 (1913). Block tires, and special apparatus for making. B. H. Divine, Utica, N. Y., U. S. A.

4,207 (1913). Bat handles comprising cane and rubber sections. A. C. Taylor, 46 Melbourne avenue, Bowes Park, London.

4,214 (1913). Rubber substitutes. J. R. McPhie and M. E. McPhie, 56 Holly avenue, Jesmond, Newcastle-on-Tyne.

4,236 (1913). Tread bands for wheel tires. T. Dudson, 42 High street, Abertridwr, Glamorganshire.

*4,302 (1913). Detachable rim attachments to wheels. F. R. Barker, 1049 Beacon street, Brookline, Mass., U. S. A.

4,313 (1913). Tire attachments to rims. C. T. B. Sangster, Dale Road, Bournbrook, near Birmingham.

4,329 (1913). Elastic ring projectile for use in games. E. Hackh, 2 Gutbrodstrasse, Stuttgart, Wurtemburg, Germany.

4,488 (1913). Rubberized leather manufacture. J. Herbert, 56 Radipole Road, Fulham, London.

4,558 (1913). Means for connecting the ends of rubber tires or ropes. H. Brook, 193 Church street, Blackpool, and J. C. Burton and H. H. Burton, Granby Rubber Works, Post Office Place, Leicester.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 17, 1914.]

4,600 (1913). Wheel tires. J. F. F. W. Ure, 13 Trinity Gardens, Folkestone, Kent.

4,634 (1913). Tool for removing and replacing tires. J. R. Brown, Dresden House, Llanidloes, Montgomeryshire.

4,645 (1913). Tennis racket frame comprising rubber spring. S. Brown, 40 Whitecross street, London, E.C.

4,649 (1913). Means for expanding a ring carrying an elastic tire for assemblage in a wheel rim. J. S. Foley, 5 High street, West Bromwich, and F. W. Baker, Hagley Road, Stourbridge, Worcestershire.

4,663 (1913). Plastic compositions formed of waste vulcanized rubber, gutta percha, caoutchouc, etc. A. Oetker, 124 Flottbeker Chaussee, Ottensen, Altona, Germany.

4,814 (1913). Sponge holders of waterproof fabric. H. K. Heide, 15 Preysingstrasse, Munich, Germany.

4,821 (1913). Artificial teeth with coned recesses for the rubber plate. H. A. Wienand, 10 Tannenstrasse, Frankfurt-on-Main, Germany.

4,823 (1913). Molded combs formed with solid back and hollow handle. H. O. Traun, 59 Meyerstrasse, Hamburg, Germany.

*4,846 (1913). Spring wheel. W. S. Hancock, 1806 Higgs Place, N.W., and A. V. Mitchell, 1529 New Hampshire avenue—both in Washington, D. C., U. S. A.

*4,885 (1913). Spring wheel. C. I. Wright, Berkeley, Cal., U. S. A.

4,887 (1913). Stoppers for jars, etc. W. W. Whalley, 133 Speakman Road, St. Helens, Lancashire.

4,889 (1913). Vehicle wheels. C. Challiner, The Glen, Anson Road, Victoria Park, Manchester.

4,905 (1913). Tire attachments to rims. J. C. Moore, Nightingale Hall, Lower Edmonton, London.

4,913 (1913). Devulcanizing india rubber. E. Zappert, 27 Chancery Lane, London.

4,929 (1913). Wheel tires. E. B. Killen, 27 Queen Victoria street, London.

5,019 (1913). Spring wheel with rubber tread sections. J. R. C. Hodgson, 214 Jarvis street, Toronto, Ont., Canada.

5,044 (1913). A rubber fabric or like flexible mud-guard. R. O. Zimmerling, 33 Ladysmith avenue, East Ham, London.

5,081 (1913). Hat fastening device comprising an elastic or flexible strip. H. W. Hulse, 127 Villa Road, Handsworth, Birmingham.

5,083 (1913). Fibrous compositions containing rubber, gutta percha, etc. T. C. Redfern, 24 Woodend Lane, Hyde, Cheshire.

5,084 (1913). Molding boot soles from rubber-containing compositions. T. C. Redfern, 24 Woodend Lane, Hyde, Cheshire.

*5,089 (1913). Vulcanizing presses. R. Bridge, Castleton Ironworks, Castleton, Lancashire. (Williams Foundry & Machine Co., Akron, Ohio, U. S. A.)

5,169 (1913). Air tubes for wheel tires. C. R. Crombie, Dalmeny street, Leith Walk, Edinburgh.

5,214 (1913). Liner or gaiter for repairing damaged pneumatic tires or for preventing punctures. C. Hunter, Bowhill Hotel, Cardenden, Fifeshire.

5,242 (1913). Insulating glove of rubber. St. Helens Cable & Rubber Co. and H. Evans, Arpley, Warrington, Lancashire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 25, 1914.]

5,299 (1913). Spring wheels. A. T. Smith, 30 St. John's Road, Birkdale, Lancashire.

5,355 (1913). Non-sticky composition for automatically closing punctures in tires. E. C. R. Marks, 46 Lincoln's Inn Fields, London.

5,356 (1913). Artificial feet. B. Graham, 118 Great Victoria street, Belfast.

*5,434 (1913). Spring wheel with continuous outer resilient ring. A. K. Lovell, 129 Olive street, New Haven, Conn., U. S. A.

5,542 (1913). India rubber solution in making cup leather packings. A. R. Trist, 4 Lloyd's avenue, London.

5,591 (1913). Tire tool. J. Thresher, The Terrace, Hemsby, Norfolk.

5,623 (1913). Spring wheel. A. Tetétleni, 10 Jozsef ter, Budapest.

*5,642 (1913). Feeding bottle. E. W. Morgan, Spring City, Pa., U. S. A.

5,676 (1913). A metal rim, or the metal band to which a rubber tire is vulcanized. R. V. Stick, 14 Kinglake street, Liverpool.

5,694 (1913). Fastening for goloshes. R. Schreiber, Karoschke, near Obernigk, Germany.

*5,739 (1913). Infants' fabric bath tub. H. Sefton-Jones, 285 High Holborn, London. (Heaton Manufacturing Co., Wilmington, Del., U. S. A.)

5,776 (1913). Solid rubber tire secured by the inturned edges of the rim. I. L. Hindle, 24 Irton Road, Southport, Lancashire.

NEW ZEALAND.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, MAY 7, 1914.]

34,484 (1913). Rubber tire and attachment and detachment to wheels. E. P. Killen, 27 Queen Victoria street, London, Eng.

34,442 (1913). Pad garter. C. A. Hamlin, Auckland, New Zealand.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

465,476 (November 29, 1913). Elastic tire for wheels. O. Mossinan.

465,483 (November 29). Anti-skid device for automobiles and other vehicles. S. M. Bickford.

465,515 (November 22). Wheel tire. A. W. Livingston.

465,544 (December 1). Air chamber for pneumatic automobile tires. W. Dunbar.

465,599 (December 2). Anti-skid device for covers and pneumatic tires of bicycles and automobiles. A. Jablonsky.

465,626 (December 3). Improvements in pneumatic tires and rims used with them. T. Sloper.

465,721 (December 1). Process of making an elastic fabric, the rubber in which is completely hidden by a fabric superimposed on its two faces by means of only two shuttles, and articles obtained by this process. Laflèche Frères & Cie.

465,735 (December 4). Improvements in vehicle tires. C. Flake Forster.

465,812 (December 6). Pneumatic sole for footwear. H. Wagener.

465,865 (December 3). Protection of pneumatic tires. M. Brun.

465,903 (February 17). Process of treating used covers of pneumatic tires, with the object of recovering their constituent elements. G. Reynaud.

465,950 (October 25). Imperforable cover for wheel tires. A. de la Houssaye.

465,985 (December 2). Improvements in elastic vehicle tires. J. Spyker.

466,048 (December 11). Pneumatic tire. J. J. Luck.

466,064 (December 11). Elastic tire for vehicle wheels. T. Emontelle and P. Sebaste.

466,155 (February 22). Movable protector for wheel tires. G. J. Krol.

466,141 (December 13). Improvements in manufacture of rubber buttons for gaiters and other uses, and in the manner of fixing them. R. Brack.

466,235 (February 25). Rubber footwear. Etablissements Hutchinson.

466,243 (December 16). Process for regeneration of rubber. Xylos Rubber Co., Ltd.

466,270 (February 26). Metallic wheel with central pneumatic tire. D. Crayssac.

466,376 (February 28). Elastic fitting, specially applicable to wheel tires and its method of manufacture. L. V. Pinca.

466,381 (March 1). Perfected process for the manufacture of an elastic fitting specially applicable to wheel tires. Madame L. Marsan.

466,399 (December 19). Improvements in pneumatic tires. Gray & Sloper.

466,484 (December 22). Improvements in tires. R. M. Thorp.

466,492 (December 23). Improved tire for vehicle wheels. L. H. Honrighausen.

466,502 (December 23). Mechanical process for applying an adhesive substance to rubber tires. P. Blache.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Bobet, Ingenieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

275,716, Class 39b (November 1, 1912). Process for coagulation of rubber latex. C. H. Boehringer Sohn, Nieder Ingelheim-am-Rhein.

275,857, Class 39b (June 3, 1913). Process for producing plastic masses through the action of aldehydes on albuminous substances. Hans Blücher, Hardenbergstrasse, Leipzig, and Ernst Krause, Sedanstrasse 6, Berlin-Steglitz.

275,816, Class 63c (August 20, 1912). Hollow rubber tire, in which the tread is specially arranged with portions cut out. Max Cyrus Overman, New York.

276,185, Class 12o (March 29, 1913). Process for purification of isoprene. Dr. Iwan Ostromissiensky, Moscow.

THE KINGDOM OF BELGIUM.

PATENTS PUBLISHED.

265,304 (May, 1914). Improvements in processes and molding appliances for the manufacture of rubber articles. F. T. Roberts, Trenton and Cleveland, U. S. A.

265,223 (May, 1914). Felt rubber. J. Burthoul, Rue du Pont Neuf, Bruxelles.

265,559, (June, 1914). Rubber substitute with a basis of acetyl-cellulose, pellicles and varnishes, as well as oilcloths, rubbered fabrics, imitation leathers, and like substances. Actien Gesellschaft für Anilin Fabrikation, Berlin S. O. 36.

265,698 (June, 1914). Protecting hoops for the rims, armatures and rubber of solid tires. Continental, Société Anonyme de Caoutchouc Manufacturé, Paris.

265,872 (June, 1914). Rubber insulator for protection of flooring. F. Range, Tuckum, Russia.

265,942 (June, 1914). Tent with metallic frame. E. Christophe and R. Coulon, Bruxelles.

MARKED DROP IN GUAYULE RECEIPTS.

United States receipts of Guayule rubber for the ten months ending April 30, were: 1912—12,215,866 pounds; 1913—8,688,107 pounds; 1914—1,415,894 pounds.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

An importer in the Near East desires correspondence (in French) with American exporters of corsets, garters, etc. Prices should be quoted c. i. f. port of entry. Report No. 13,364.

A firm of general importers in the Levant is in the market for American boots, shoes and rubbers of all kinds. Correspondence should be in French and prices quoted c. i. f. city of destination. Report No. 13,368.

An American consular officer states that a firm in his district operating a large department store desires to secure c. i. f. quotations from American manufacturers of rubbers, overshoes, etc. Correspondence may be in English. Report No. 13,369.

A manufacturer of suspenders in a Mediterranean country desires to procure direct from American manufacturers suspender elastic for use in his factory. Correspondence may be in English, but prices should be reduced to Italian lire if possible and should be quoted including delivery at port of destination, samples accompanying quotations if convenient. Report No. 13,385.

A firm of wholesalers and importers of rubber goods doing a considerable business throughout Italy desires direct connection with American manufacturers of rubber goods of all kinds, being particularly interested in and desiring quotations on the following articles: Rubber cloth for beds and hospitals; rubber cloth and varnished cloth for balloons and dirigibles; automobile and bicycle tires; rubbers and rubber heels; asbestos and rubber machinery, furnishings and supplies. Correspondence in Italian preferred, though French is understood. Prices should be quoted c. i. f. Genoa or Venice, and weights and measures should be in the metric system. Report No. 13,405.

A wagon and automobile manufacturer in a European country desires the agency of a standard make of automobile tire. The inquirer is said to be well equipped to handle such a line successfully. Report No. 13,435.

BIDS SOLICITED FOR GOVERNMENT SUPPLIES.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 4, under schedule 7026, on fire hose.

LATE CUSTOM RULING

The protest of W. A. Walker against the assessment on raincoats of 50 per cent. ad valorem, as cotton wearing apparel, and the attempt to prove that rubber predominated in the make-up of these garments, were not sustained, the Government analyst finding cotton to be the component of chief value.

FIRE HOSE AWARDS.

Contracts for 5,000 feet of fire hose and for rubber tires and tubes were recently awarded by the fire department of New York City to the Empire Rubber & Tire Co., of Trenton. Other recently awarded contracts include: Fort Worth, Texas, 5,000 feet to the Eureka Fire Hose Co., of New York; New Bedford, Massachusetts, 2,000 feet to the C. C. C. Fire Hose Co., of Boston; Scranton, Pennsylvania, 4,000 feet to the New Jersey Car Spring & Rubber Co., of Jersey City; Passaic, New Jersey, 5,000 feet to the United & Globe Rubber Manufacturing Cos., of Trenton. The City of Wilkes-Barre, Pennsylvania, divided its contract for 2,900 feet of hose between The B. F. Goodrich Co., of Akron, the Gutta Percha & Rubber Manufacturing Co., of New York, and the Bi-Lateral Fire Hose Co., of Chicago.

The Xenia Rubber Manufacturing Co., of Xenia, Ohio, reported as having plans under way for the erection of a plant at Dayton, Ohio, has purchased ground and started work on buildings in Xenia, where it has decided to remain. This company, incorporated for the purpose of manufacturing all kinds of rubber goods, with a capital stock of $40,000 (all common), is already operating in a small way, employing twelve hands. The officers are: J. H. Sanders, president; E. D. Stroup, vice-president; N. Hudson, treasurer, and L. M. Bickett, secretary and general manager.

Review of the Crude Rubber Market.

THE London market for fine Pará displayed an advancing tendency early in the month, a rise being established of 1*d.*, which has so far been practically maintained. The strength of Pará qualities has been attributed to the diminished receipts at the primary markets. Some advices from Brazil, however, speak of lower prices being probable and comment on the obstacles confronting the government in the adjustment of the national finances.

A comparison of the London prices for fine Pará shows: June 25, 2*s.* 9¼*d.* (68.41 cents); July 25, 2*s.* 10¼*d.* (70.44 cents).

While fine Pará has thus gone up 1*d.* within a month, plantation rubber has within the same period dropped 1¼*d.*, the decline having been reflected in New York quotations. The exact equivalents in American currency of the London quotations for plantation (basis of first latex) are: June 25, 2*s.* 3*d.* (54.73 cents); July 25, 2*s.* 1¾*d.* (52.20 cents).

Much attention has been directed on both sides of the water to the willingness of estate owners to sell their 1915 product at relatively low prices, to ensure its finding a market. Thus plantation rubber has been offered at 51½ cents for delivery first half of 1915, while any price under 50 cents would eliminate any profit. Spot rubber has been quoted at notably higher prices, first latex for August delivery standing at 55½ cents.

The London auction of July 7 included about 1,100 tons of plantation rubber, which met with fair competition, while the prices realized on the first day showed a reduction from those of previous sale. On the second day, however, a recovery took place which favorably affected the contract market. Cable advices of the auction of July 21, comprising 1,000 tons, report a gradual improvement during the sale, which closed higher than it started.

At the Antwerp sale of June 23 there were offered 259 tons Congos and 208 tons plantation rubber. Of the former 147 tons were sold, and of the latter 185 tons. The average fall was about 5½ per cent. Considering the inactive state of the principal markets, this result was thought relatively satisfactory. Stock in Antwerp at the end of June was 345 tons, as compared with 1,085 tons on June 30, 1913. For the sale of July 23, 45 tons Congos and 146 tons plantation rubber were announced.

The 111 tons (mostly plantation) offered at Amsterdam June 26 were chiefly sold below recent valuations. The next sale (fixed for July 29) will include 156 tons *Hevea*, and 11 tons *Ficus*.

In the Rotterdam sale of July 3, 240 tons *Hevea* and 130 tons Congos, etc., were included. The *Heveas* were sold and the Congos bought in.

Failing any notable demand for consumption, the Hamburg market has been quiet.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and July 31, the current date:

PARA.	Aug. 1, '13.	July 1, '14.	July 31, '14.
Islands, fine, new	74@	58@59	57@59
Islands, fine, old	.....	59@60	58@62
Upriver, fine, new	85@86	68½@69	72@73½
Upriver, fine, old	92@93	69½@70	72@75
Islands, coarse, new	30@31	28@29	27@29
Islands, coarse, old	.....	.....	.....
Upriver, coarse, new	51@52	39½@41	39½@42
Upriver, coarse, old	39@40	.....	.....
Cameta	37@38	31½@32½	30½@31½
Caucho, upper	51@52	39@40	38@41
Caucho, lower	.....	36@37	35@37
PLANTATION CEYLON.			
Fine smoked sheet	70@71	57@63	56@59
Fine pale crepe.. near-by	68@69	56@57	53@56
Fine pale crepe.. forward		55½@56½	52@53
Fine sheets and biscuits unsmoked	.....	56@57½	54@56
CENTRALS.			
Corinto	.....	41@42	39@42
Esmeralda, sausage	52@	39@40	38@41
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	52@	38@40	35@40
Panama	.....	.....	.....
Mexican plantation, sheet	.....	42@48	40@47
Mexican, scrap	52@	38@40	36@41
Mexican, slab	35@	.....	25@35
Mangabeira, sheet	.....	.....	.....
Guayule	.....	25@35	25@35
Balata, sheet	70@72	45@48	45@58
Balata, block	51@53	.....	48@53
AFRICAN.			
Lopori, ball, prime	62@	45@52	45@53
Lopori, strip, prime	60@	.....	.....
Aruwimi	55@57	35@46	38@47
Upper Congo, ball red	55@56	38@42	.....
Ikelemba	57@58	35@45	38@45
Sierra Leone, 1st quality	55@58	35@40	35@47
Massai, red	62@63	48@50	40@50
Soudan Niggers	50@55	38@40	36@46
Cameroon, ball	40@49	25@35	25@35
Benguela	.....	27@32	25@31½
Madagascar, pinky	55@60	.....	.....
Accra, flake	24@25	22½@23	22@22½
EAST INDIAN.			
Assam	35@70	.....	35@55
Pontianak	6⅜@ 6⅝	.....	5⅞@ 6½
Borneo III	32@30	.....	20@25
Borneo II	45@48	.....	27@29
Borneo II	55@60	.....	45@

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"During the first half of July the market for commercial paper remained practically the same as for the past three months, the demand being good and rates easy, but the latter part of the month the demand fell off somewhat and rates advanced a little, the best rubber names ruling at 4½@5 per cent., and those not so well known 5¼@6 per cent.

NEW YORK PRICES FOR JUNE (NEW RUBBER).

	1914.	1913.	1912.
Upriver, fine	$0.69@0.71	$0.87@0.92	$1.08@1.12
Upriver, coarse	.40@ .42	.54@ .62	.86@ .91
Islands, fine	.58@ .62	.82@ .85	1.01@1.06
Islands, coarse	.27@ .29	.33@ .39	.55@ .59
Cametá	.31@ .34	.40@ .43	.63@ .65

Rubber Scrap Prices.

LATE NEW YORK QUOTATIONS.—Prices paid by consumers for carload lots, per pound:

	July 31, '14.
Old rubber boots and shoes—domestic	6⅝@ 6¾
Old rubber boots and shoes—foreign	6½@ 6⅝
Pneumatic bicycle tires	3¾@ 4
Automobile tires	4⅝@ 4¾
Solid rubber wagon and carriage tires	5 @
White trimmed rubber	10 @10¼
Heavy black rubber	3¾@ 4
Air brake hose	3⅛@
Garden hose	1 @ 1¼
Fire and large hose	2 @ 2⅛
Matting	⅝@ ¾
No. 1 white auto tires	5½@
Foreign auto tires	4½@ 4⅝

Amsterdam.

JOOSTEN & JANSSEN report [July 10]:

At the recent sale a marked demand was noticeable for *Heveas*. The average result was a reduction on valuations of 7 per cent. for *Heveas* and of 1½ per cent. for *Ficus*.

Rotterdam.

HAVELAAR & DE VRIES Report [July 7]:

Prices at sale of 3rd instant were below valuations. While the holders of *Heveas* met the market, the owners of Congos withdrew their offerings.

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to June 22, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.)

	1913.	1914.
To Great Britain ..... *pounds*	5,002,102	7,235,552
To United States	2,936,581	4,311,149
To Belgium	1,383,294	2,315,192
To Australia	272,305	162,885
To Germany	111,009	849,187
To Japan	99,611	177,606
To Italy	33,802	312
To Austria	26,075	.....
To Straits Settlements	9,482	37,249
To Holland	992	.....
To India	209	500
To France	.....	144,043
To Russia	.....	98,482
Total	9,875,462	15,332,157

(Same period 1912, 5,044,285; same period 1911, 2,270,565.)

The export figures of rubber given in the above table include the imports re-exported. These amount to 1,813,360 pounds—1,515,894 pounds from the Straits and 285,842 pounds from India. To arrive at the approximate quantity of Ceylon rubber exported to date, deduct the quantity of imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported to Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore, May 31.	Malacca, May 31.	Penang, May 31.	Port Swetenham, June 9.	Total.
Great Britain...*pounds*	9,141,637	2,100,933	7,403,600	10,711,911	29,358,081
Continent	1,188,366	5,750	328,933	1,335,624	2,858,673
Japan	462,418	.....	.....	.....	462,418
Ceylon	153,917	.....	467,867	760,340	1,382,124
United States	4,221,438	.....	414,133	135,590	4,772,161
Australia	27,883	.....	.....	.....	27,883
Total, 1914.....	15,195,659	2,106,683	8,614,533	12,944,465	38,861,340
Total, 1913.....	9,564,856	.....	5,863,467	12,290,146	27,718,469
Total, 1912.....	5,014,131	.....	3,211,759	9,135,496	17,361,386
Total, 1911.....	2,192,751	.....	1,764,641	5,994,795	9,952,187

Antwerp.

RUBBER STATISTICS FOR JUNE.

DETAILS.	1914.	1913.	1912.	1911.	1910.
Stocks, May 1....*kilos*	356,185	1,053,993	444,437	614,010	543,863
Arrivals in June—					
Congo sorts	178,678	332,365	174,315	382,972	356,288
Other sorts	2,155	26,520	10,529	11,860	29,384
Plantation sorts	238,365	143,820	97,942	32,160	39,929
Aggregating	775,383	1,556,698	727,223	1,041,002	969,464
Sales in June	344,506	471,555	384,032	267,025	508,947
Stocks, June 30.....	430,877	1,085,143	343,191	773,977	460,517
Arrivals since Jan. 1—					
Congo sorts 1,330,363	1,651,140	1,417,416	1,642,593	1,655,626	
Other sorts	65,538	73,041	69,166	246,953	167,522
Plantation sorts 1,352,220	1,011,929	612,634	331,476	262,060	
Aggregating 2,748,121	2,736,110	2,099,216	2,221,022	2,085,208	
Sales since January 1..2,876,525	2,162,027	2,430,563	2,035,257	2,166,203	

RUBBER ARRIVALS FROM THE CONGO.

JUNE 16.—By the steamer *Elisabethville:*

Bunge & Co.....	(Comp. Commerciale Congolaise)	*kilos*	20,000	
do	(Cie du Congo belge)		860	
do	(Forminière)		3,100	
do	(Intertropical)		4,600	
do			400	
Société Colonial Anversoise	(Kasai)		36,000	
do			2,250	
Crédit Colonial & Commercial (Anc. L. & W. Van de Velde)	(Comfina)		21,000	
do	(Crevelde)		6,000	
W. Mallinckrodt & Co.	(Alimaienne)		4,500	
Comp. Colonial Franco-belge (Charles Dethier)	(American Congo Cy)		6,800	
do	(Comminière)		41,450	
do	(Cie forestière Sangha-Cubanghi)		19,400	
Arthur Henrion			160	166,520

JULY 7.—By the steamer *Aversville:*

Bunge & Co.	(Belgika)	*kilos*	1,800	
do	(Alberta)		700	
do	(Forminière)		4,400	
do	(Comfina)		8,300	
do	(Cie du Congo belge)		1,400	
Société Coloniale Anversoise	(Intertropical)		12,700	
do	(Lomami)		6,680	
do	(H. C.)		12,200	
Crédit Colonial & Commercial (Anc. L. & W. Van de Velde)	(Kasai)		46,500	
do	(Crevelde)		2,700	
Comptoir Colonial franco-belge (Charles Dethier)	(Cie forestière Sangha-Oubanghi)		11,850	
do	(Comminière)		10,770	
do	(American Congo Cy)		3,375	123,375

IMPORTS FROM PARA AT NEW YORK.

[*The Figures Indicate Weight in Pounds.*]

JUNE 12.—By the steamer *Hubert*, from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	133,100	4,600	99,300	10,700=	247,700
General Rubber Co.	30,000	6,700	55,500	15,400=	107,600
Meyer & Brown	7,200	.....	9,200	77,400=	93,800
Hagemeyer & Brunn	12,100	2,900	27,800	600=	43,400
H. A. Astlett & Co.	21,800	18,500	29,800	40,000=	110,100
Henderson & Korn	50,000	4,300	81,000	97,300=	232,600
W. R. Grace & Co.	5,700	.....	10,600	.....=	16,300
American Express Co.	22,200	.....	.....	.....=	22,200
F. Rosenstern & Co.	1,400	.....	4,200	300=	5,900
G. Amsinck & Co.	3,800	.....	3,500	2,100=	9,400
Robinson & Co.	60,100	15,500	33,700	16,400=	125,700
Total	347,400	52,500	354,600	260,200=	1,014,700

JULY 1.—By the steamer *Denis*, from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	83,300	17,700	137,700	60,900=	299,600
General Rubber Co.	78,200	31,300	43,300	3,500=	156,300
Meyer & Brown	3,900	2,500	91,900	56,500=	154,800
Hagemeyer & Brunn	16,100	2,900	38,300	6,400=	63,700
H. A. Astlett & Co.	33,100	13,100	38,400	17,300=	101,900
Henderson & Korn	59,300	19,700	8,700	900=	88,600
Robinson & Co.	52,400	11,800	14,200	4,400=	82,800
Robert Badenhop	4,300	.....	11,900	.....=	16,200
G. Amsinck & Co.	3,200	700	700	5,900=	10,500
W. R. Grace & Co.	.....	.....	4,000	.....=	4,000
Total	333,800	99,700	389,100	155,800=	978,400

JULY 15.—By the steamer *Boniface*, from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	53,700	13,200	91,500	40,100=	198,500
General Rubber Co.	26,300	5,900	10,000	200=	42,400
Meyer & Brown	20,000	400	55,900	218,200=	294,500
Henderson & Korn	50,700	20,000	72,800	.....=	143,500
H. A. Astlett & Co.	8,600	5,000	23,100	.....=	36,700
Robert Badenhop	20,000	.....	11,200	.....=	31,200
G. Amsinck & Co.	13,700	1,600	3,600	3,500=	22,400
Hagemeyer & Brunn	.....	1,100	14,000	.....=	15,100
Robinson & Co.	14,100	7,700	.....	.....=	21,800
Total	207,100	54,900	282,100	262,000=	806,100

PARA RUBBER VIA EUROPE.

		Pounds.
JUNE 22.—By the *Celtic*=Liverpool:		
W. R. Grace & Co. (Fine)	4,500	
W. R. Grace & Co. (Caucho)	7,500	12,000
JUNE 25.—By the *President Lincoln*=Hamburg:		
Raw Products Co. (Coarse)	11,200	
Various (Fine)	10,000	21,200
JUNE 26.—By the *Aquitania*=Liverpool:		
Raw Products Co. (Coarse)		17,000
JUNE 29.—By the *Baltic*=Liverpool:		
Johnstone, Whitworth & Co. (Fine)		4,500
JULY 3.—By the *Mauretania*=Liverpool:		
Raw Products Co. (Fine)	4,500	
Raw Products Co. (Coarse)	7,000	11,500
JULY 6.—By the *Matura*=Ciudad Bolivar:		
G. Amsinck & Co. (Fine)	9,500	
G. Amsinck & Co. (Coarse)	12,000	
Yglesias, Lobo & Co. (Fine)	11,000	
Yglesias, Lobo & Co. (Coarse)	3,500	
General Export & Commission Co. (Fine)	22,500	
General Export & Commission Co. (Coarse)	15,000	
Schutte, Bunemann & Co. (Fine)	11,200	84,700
JULY 6.—By the *Adriatic*=Liverpool:		
Various (Coarse)		5,000
JULY 10.—By the *Graf Waldersee*=Hamburg:		
Various (Fine)		13,500
JULY 11.—By the *Cedric*=Liverpool:		
Various (Fine)		4,500
JULY 15.—By the *Kronprinzessin Cecilie*=Hamburg:		
Raw Products Co. (Coarse)	9,000	
Various (Fine)	25,000	34,000
JULY 17.—By the *Mayaro*=Ciudad Bolivar:		
General Export & Commission Co. (Fine)	30,000	
General Export & Commission Co. (Coarse)	7,000	
Yglesias, Lobo & Co. (Fine)	3,000	
Yglesias, Lobo & Co. (Coarse)	3,000	
G. Amsinck & Co. (Fine)	1,000	44,000
JULY 18.—By the *Celtic*=Liverpool:		
Johnstone, Whitworth & Co. (Fine)		11,200
JULY 20.—By the *Aquitania*=Liverpool:		
Arnold & Zeiss (Fine)	22,500	
Raw Products Co. (Fine)	11,200	33,700
JULY 21.—By the *Finland*=Antwerp:		
Various (Fine)		22,500

OTHER NEW YORK ARRIVALS.

CENTRALS.

		Pounds.
JUNE 22.—By the *Virginia*=Colon:		
G. Amsinck & Co.	2,500	
A. Held	10,000	
Pottberg, Ebeling & Co.	300	12,800
JUNE 24.—By the *Prinz Sigismund*=Colon:		
Fidanque Bros. & Co.	1,000	
G. Amsinck & Co.	200	1,200
JUNE 24.—By the *Tintoretto*=Bahia:		
Adolph Hirsch & Co.	16,500	
Various	600	17,100
JUNE 26.—By the *Advance*=Colon:		
G. Amsinck & Co.	3,200	
Lanman & Kemp	1,800	
Pablo Calvet & Co.	900	
Various	2,000	7,900
JUNE 26.—By the *Guantanamo*=Mexico:		
E. Steiger & Co.	16,000	
Harburger & Stack	8,000	
G. Amsinck & Co.	600	
Wessels, Kulenkampff & Co.	5,000	
Graham, Hinkley & Co.	300	
Lawrence Johnson & Co.	3,000	
Pedro Treman & Co.	2,000	
J. N. Limbert & Co.	300	
General Export & Commission Co.	2,500	37,700
JUNE 29.—By the *Allemania*=Colombia:		
A. Held		8,000
JULY 1.—By the *Cristobal*=Colon:		
Meyer, Hecht & Co.		1,000
JULY 1.—By the *Orubo*=Colon:		
A. M. Capen's Sons		700
JULY 1.—By the *Prinz Joachim*=Colon:		
Isaac Brandon & Bros.	1,000	
Harburger & Stack	500	1,500
JULY 10.—By the *Alliance*=Colon:		
G. Amsinck & Co.		5,600
JULY 15.—By the *Prinz August Wilhelm*=Colombia:		
G. Amsinck & Co.		4,000
JULY 13.—By the *Albingia*=Colombia:		
A. Held		4,500
JULY 15.—By the *Colon*=Colon:		
G. Amsinck & Co.	3,000	
Piza, Nephews & Co.	4,000	7,000
JULY 15.—By the *Kotonia*=Mexico:		
E. Steiger & Co.	6,000	
Harburger & Stack	1,500	
General Export & Commission Co.	100	7,600
JULY 22.—By the *Prinz Sigismund*=Colon:		
A. M. Capen's Sons	5,500	
H. Wolff & Co.	1,200	
Mecke & Co.	1,200	7,900
JULY 22.—By the *Advance*=Colon:		
G. Amsinck & Co.	300	
Neuss, Hesslein & Co.	200	500

AFRICAN.

		Pounds.
JUNE 22.—By the *Isle of Mull*=Lisbon:		
Various		27,500
JUNE 25.—By the *President Lincoln*=Hamburg:		
Rubber & Guayule Agency, Inc.	27,000	
Arnold & Zeiss	11,200	
Ed. Maurer	20,000	58,200
JUNE 29.—By the *Baltic*=Liverpool:		
Johnstone, Whitworth & Co.	4,500	
Henderson & Korn	7,000	11,500
JUNE 29.—By the *Floride*=Havre:		
Various		22,500
JULY 1.—By the *Kroonland*=Antwerp:		
Various		13,500
JULY 2.—By the *Kaiserin Auguste Victoria*=Hamburg:		
Ed. Maurer	9,500	
Various	5,000	14,500
JULY 3.—By the *Mauretania*=Liverpool:		
Arnold & Zeiss		11,200
JULY 6.—By the *Adriatic*=Liverpool:		
Johnstone, Whitworth & Co.		4,500
JULY 7.—By the *Vaterland*=Antwerp:		
Various		40,000
JULY 10.—By the *Graf Waldersee*=Hamburg:		
Rubber & Guayule Agency, Inc.	27,000	
Various	7,500	34,500
JULY 11.—By the *Cedric*=Liverpool:		
Arnold & Zeiss	4,500	
Various	2,000	6,500
JULY 13.—By the *New York*=Southampton:		
Various		12,000
JULY 13.—By the *Lapland*=Antwerp:		
Various		15,000
JULY 15.—By the *Kronprinzessin Cecilie*=Hamburg:		
Ed. Maurer	22,500	
Rubber & Guayule Agency, Inc.	2,000	
Various	3,500	28,000
JULY 18.—By the *Celtic*=Liverpool:		
Henderson & Korn		2,500
JULY 20.—By the *Aquitania*=Liverpool:		
Arnold & Zeiss		11,200
JULY 21.—By the *Finland*=Antwerp:		
Meyer & Brown	11,000	
Various	45,000	56,000

EAST INDIAN.

[*Denotes plantation rubber.]

		Pounds.
JUNE 22.—By the *Rotterdam*=Amsterdam:		
Meyer & Brown	*10,000	
Various	*37,000	*47,000
JUNE 22.—By the *Philadelphia*=Southampton:		
Rumsey & Greutert	*80,000	
Robinson & Co.	*6,700	
Ed. Maurer	*16,000	
Raw Products Co.	*4,000	
Rubber Trading Co.	*6,700	
Various	*115,000	*228,400
JUNE 23.—By the *Minneapolis*=London:		
General Rubber Co.	*235,000	
Ed. Boustead & Co.	*17,500	
Henderson & Korn	*17,500	
Johnstone, Whitworth & Co.	*4,500	
Charles T. Wilson	*100,000	
F. Probst & Co.	*4,500	
Various	*23,500	*402,500
JUNE 24.—By the *Zeeland*=Antwerp:		
Meyer & Brown		*90,000
JUNE 25.—By the *St. Louis*=Southampton:		
Charles T. Wilson	*16,500	
Earle Bros.	*9,000	
Ed. Maurer	*45,000	
W. Stiles	*6,700	
Arnold & Zeiss	*6,700	
Johnstone, Whitworth & Co.	*12,500	
Rubber Trading Co.	*11,200	
Raw Products Co.	*4,500	
Goodyear Tire & Rubber Co.	*115,000	
Various	*43,300	*270,400
JUNE 25.—By the *President Lincoln*=Hamburg:		
Rubber & Guayule Agency, Inc.	*25,000	
Arnold & Zeiss	*4,500	
Henderson & Korn	*4,500	
Ed. Maurer	*15,000	*49,000
JUNE 26.—By the *Aragonia*=Singapore:		
Meyer & Brown	*65,000	
Johnstone, Whitworth & Co.	*10,000	
Arnold & Zeiss	*35,000	
The B. F. Goodrich Co.	*90,000	
Ed. Boustead & Co.	*10,000	
Ed. Maurer	*45,000	
Henderson & Korn	*50,000	
L. Littlejohn & Co.	*80,000	
Various	*160,000	*545,000
JUNE 29.—By the *Floride*=Havre:		
Michelin Tire Co.		*50,000
JUNE 29.—By the *Minnewaska*=London:		
Meyer & Brown	*85,000	
Henderson & Korn	*95,000	
J. H. Rossbach & Bros.	*33,500	
Raw Products Co.	*26,000	
Rubber Trading Co.	*4,500	
Arnold & Zeiss	*6,700	
W. R. Grace & Co.	*4,500	
Rumsey & Greutert	*3,500	
Johnstone, Whitworth & Co.	*2,200	
Ed. Maurer	*11,200	
General Rubber Co.	*300,000	
Charles T. Wilson	*50,000	
Various	*30,000	*652,100
JULY 1.—By the *Kroonland*=Antwerp:		
Meyer & Brown	*62,000	
Various	*80,000	*142,000
JULY 1.—By the *Potsdam*=Amsterdam:		
Rumsey & Greutert		*2,200
JULY 2.—By the *Birkenfels*=Colombo:		
Meyer & Brown	*36,500	
Rubber & Guayule Agency, Inc.	*19,000	
Arnold & Zeiss	*40,000	
Henderson & Korn	*7,500	
H. W. Peabody & Co.	*5,500	
Robinson & Co.	*3,500	*112,000
JULY 2.—By the *Oceanic*=Southampton:		
Henderson & Korn	*7,000	
W. R. Grace & Co.	*6,000	
Goodyear Tire & Rubber Co.	*35,000	*48,000
JULY 2.—By the *Kalomo*=Colombo:		
Meyer & Brown	*11,200	
Henderson & Korn	*105,000	
W. Stiles	*25,000	
Robinson & Co.	*10,000	
Johnstone, Whitworth & Co.	*50,000	
Various	*75,000	*276,200
JULY 2.—By the *Kaiserin Auguste Victoria*=Hamburg:		
Ed. Maurer	*12,500	
Various	*10,000	*22,500
JULY 6.—By the *St. Paul*=Southampton:		
Rumsey & Greutert	*16,000	
W. R. Grace & Co.	*2,200	
Earle Bros.	*3,500	
Robinson & Co.	*7,000	
Ed. Maurer	*15,000	
W. Stiles	*5,000	
Henderson & Korn	*33,500	
Arnold & Zeiss	*6,000	
Various	*20,000	*108,200
JULY 6.—By the *Afghan Prince*=Singapore:		
Ed. Boustead & Co.	*22,000	
The B. F. Goodrich Co.	*15,000	
Arnold & Zeiss	*36,000	
Henderson & Korn	*56,000	
L. Littlejohn & Co.	*33,500	
Ed. Maurer	*8,500	
Various	*45,000	*216,000
JULY 6.—By the *New Amsterdam*=Rotterdam:		
Meyer & Brown	*5,000	
Arnold & Zeiss	*4,500	
Robinson & Co.	*3,500	
Various	*3,500	*16,500

JULY 7.—By the *Minnehaha*=London:

Ed. Maurer	*18,000	
Ed. Boustead & Co.	*12,000	
Johnstone, Whitworth & Co.	*14,500	
Henderson & Korn	*65,000	
General Rubber Co.	*105,000	
Charles T. Wilson	*100,000	
W. R. Grace & Co.	*11,200	
Various	*35,000	*360,700

JULY 7.—By the *Vaderland*=Antwerp:

Meyer & Brown	*155,000	
Rubber & Guayule Agency, Inc.	*10,000	
Various	*90,000	*255,000

JULY 8.—By the *Olympic*=Southampton:

Meyer & Brown	*8,000	
Ed. Maurer	*60,000	
Rubber Trading Co.	*45,000	
Earle Bros.	*5,000	
Charles T. Wilson	*60,000	
Arnold & Zeiss	*11,200	
Various	*50,000	*239,200

JULY 10.—By the *Graf Waldersee*=Hamburg:

Hecht & Co.	*27,000	
Various	*20,000	*47,000

JULY 13.—By the *New York*=Southampton:

Rubber Trading Co.	*13,500	
Ed. Maurer	*5,000	
Earle Bros.	*1,200	
Various	*22,500	*42,200

JULY 13.—By the *City of Bristol*=Colombo:

Meyer & Brown	*61,000	
Arnold & Zeiss	*40,000	
Henderson & Korn	*65,000	
Johnstone, Whitworth & Co.	*50,000	
Various	*100,000	*316,000

JULY 13.—By the *Lapland*=Antwerp:

Meyer & Brown	*40,000	
Various	*75,000	*115,000

JULY 13.—By the *Minnetonka*=London:

General Rubber Co.	*230,000	
Charles T. Wilson	*30,000	
Henderson & Korn	*6,000	
W. R. Grace & Co.	*6,000	
Various	*2,000	*274,000

JULY 14.—By the *Noordam*=Amsterdam:

Rubber Trading Co.		*55,000

JULY 15.—By the *Kronprinzessin Cecilie*=Hamburg:

Henderson & Korn	*2,200	
Rubber & Guayule Agency, Inc.	*3,500	
Various	*18,000	*23,700

JULY 16.—By the *Philadelphia*=Southampton:

Various		*40,000

JULY 21.—By the *Finland*=Antwerp:

Meyer & Brown	*13,000	
Various	*40,000	*53,000

JULY 21.—By the *Guatemala*=Havre:

Michelin Tire Co.		*50,000

JULY 21.—By the *Ryndam*=Amsterdam:

Meyer & Brown	*60,000	
Manhattan Rubber Mfg. Co.	*8,000	
Robinson & Co.	*3,500	
Arnold & Zeiss	*4,500	
Various	*30,000	*106,000

JULY 21.—By the *Minneapolis*=London:

General Rubber Co.	*35,000	
W. R. Grace & Co.	*2,200	
Charles T. Wilson	*22,500	
Ed. Boustead & Co.	*18,000	
Arnold & Zeiss	*6,000	
Johnstone, Whitworth & Co.	*2,000	
Ed. Maurer	*20,000	
Robert Badenhop	*9,000	
Robinson & Co.	*16,000	
Goodyear Tire & Rubber Co.	*160,000	
Various	*50,000	*340,700

JULY 22.—By the *Adamstrum*=Colombo:

Meyer & Brown	*23,500	
Rubber & Guayule Agency, Inc.	*10,000	
Henderson & Korn	*17,000	
Robinson & Co.	*17,000	
Johnstone, Whitworth & Co.	*4,500	
Various	*50,000	*122,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—JUNE, 1914.

	Pounds.	Value.
Imports:		
India rubber	9,382,713	$4,869,930
Balata	106,295	61,432
Gutta percha	130,347	24,913
Gutta jelutong (Pontianak)	1,389,611	59,910
Total	11,008,966	$5,016,185
Exports:		
India rubber	68,274	39,092
Balata	12,297	6,630
Guayule	2,250	1,058
Rubber scrap, imported	1,255,352	86,269
Rubber scrap, exported	484,195	59,719

BOSTON ARRIVALS.

IMPORTS IN JUNE, 1914.

	Pounds.	Value.
Gutta jelutong	60,000	$2,181
Gutta percha	45,705	9,845
India rubber	35,587	17,001

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA AND MANAOS FOR THE FIRST HALF YEAR OF 1914. (IN KILOGRAMS.)

EXPORTERS—	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Total exported.	Stock in Pará on 30th June, 1914.	GRAND TOTAL.
Zarges, Berringer & Co. Pará / Zarges, Ohliger & Co.—Manáos	1,298,289	286,114	1,004,926	789,053	3,378,382	2,373,298	370,897	331,162	1,284,197	4,359,554	7,737,936	110,000	7,847,936
General Rubber Co. of Brazil—Pará and Manáos	806,970	180,998	540,532	746,962	2,275,462	628,028	134,815	65,945	566,421	1,395,209	3,670,671	38,000	3,708,671
Pralow & Co.—Manáos	728,559	174,066	260,315	219,898	1,382,838	761,706	120,359	246,882	403,204	1,532,151	2,914,989	.....	2,914,989
J. Marques—Pará	473,656	139,889	729,405	671,835	2,014,785	609,812	17,875	23,960	150,037	801,684	2,876,469	90,000	2,906,469
Suarez Hermanos & Co., Ltd.—Pará	83,798	4,307	15,676	64,713	168,494	632,282	.....	74,367	589,197	1,295,846	1,464,340	.....	1,464,340
Pires Teixeira & Co.—Pará	100,518	23,969	416,147	87,795	628,429	191,561	.....	7,920	.....	199,481	827,910	25,000	852,910
De Lagotellerie & Co.—Pará and Manáos	60,849	8,250	26,749	70,553	166,401	264,558	52,292	59,193	40,484	416,527	582,928	.....	582,928
Seligmann & Co.—Pará. / G. Deffner & Co.—Manáos	46,431	.....	10,993	137,905	195,329	244,847	.....	39,627	28,982	313,456	508,785	80,000	588,785
J. G. Araujo—Manáos	12,165	3,731	5,565	3,201	24,662	76,951	4,749	14,287	1,333	97,320	121,982	.....	121,982
Adelbert H. Alden, Ltd.—Pará and Manáos	.....	.....	.....	.....	.....	20,400	3,415	6,029	6,336	36,180	36,180	30,000	66,180
W. Peters & Co.—Manáos	.....	.....	.....	.....	.....	1,100	.....	3,265	530	4,895	4,895	.....	4,895
Armazens Andresen — Manáos	.....	.....	.....	.....	.....	.....	.....	1,210	.....	1,210	1,210	.....	1,210
Sundry exporters	89,521	12,147	37,509	35,233	174,408	365,025	42,376	91,537	170,987	669,925	844,333	.....	844,333
	3,700,756	833,471	3,047,817	2,827,146	10,409,190	6,169,568	746,778	965,384	3,241,708	11,123,438	21,532,628	373,000	21,905,628
From Itacoatiára, direct	7,520	920	3,120	6,000	17,560	36,328	4,564	24,333	22,146	87,371	104,931	.....	104,931
From Iquitos, direct	59,206	4,091	17,130	200,725	281,152	185,051	11,152	50,126	302,869	549,198	830,350	.....	830,350
Stock in first hands in Pará	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	450,000		450,000
From Iquitos and Manáos on board S.S. "Atahualpa"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	353,000		353,000
From Manáos on board S.S. "Boniface"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59,000		59,000
Stock held by Syndicate J. Marques	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	800,000		800,000
Total	3,767,482	838,482	3,068,067	3,033,871	10,707,902	6,390,947	762,494	1,039,843	3,566,723	11,760,007	22,467,909	2,035,000	24,502,909

EXPORTS.

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
To Europe	16,061,547	14,334,668	18,656,543	18,575,451	19,278,263	20,523,909	19,805,223	22,979,328	19,757,718	21,994,900	22,114,618
To United States	15,033,395	16,309,468	15,260,345	16,192,304	16,587,321	17,539,442	19,646,980	15,060,490	16,100,881	21,367,493	17,101,115
Total kilos	31,094,942	30,644,136	33,916,888	34,767,755	35,865,584	38,063,351	39,452,203	38,039,818	35,858,599	43,362,393	39,215,733

ENTRIES.

	1903-1904	1904-1905	1905-1906	1906-1907	1907-1908	1908-1909	1909-1910	1910-1911	1911-1912	1912-1913	1913-1914
July	1,280	1,230	1,450	1,840	1,370	1,300	1,400	2,340	1,410	1,940	2,120
August	1,230	1,260	1,300	1,690	1,500	1,890	1,870	1,870	1,590	1,900	1,600
September	2,010	1,780	2,200	2,070	2,410	2,355	2,020	1,980	2,630	2,620	2,880
October	2,440	2,820	3,580	3,030	3,200	3,460	3,275	3,170	2,990	3,920	3,740
November	2,980	2,800	2,890	3,480	3,200	3,430	4,640	3,790	3,550	3,715	2,550
December	3,530	3,390	3,270	2,610	2,560	3,300	3,510	2,640	3,830	4,920	3,590
January	4,360	4,590	5,710	3,780	4,860	5,480	5,490	4,130	4,860	5,140	4,420
February	3,680	4,320	3,920	3,060	3,340	5,040	4,760	5,795	4,850	4,990	4,610
March	3,940	5,000	3,700	5,830	4,240	4,140	5,210	3,540	4,400	4,265	4,850
April	2,070	2,120	2,500	4,490	3,100	3,760	3,600	3,490	3,270	3,540	3,830
May	1,560	2,260	2,320	2,625	3,210	2,340	2,170	3,060	3,410	2,880	2,890
June	1,500	1,470	1,650	1,500	1,660	1,570	1,220	1,725	2,570	2,105	2,050
Total, tons	30,580	33,060	34,490	38,005	36,650	38,065	39,165	37,530	39,360	41,935	39,130

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An additional cable is to be laid during the summer between New York and Colon on the Isthmus of Panama. The laying of this cable, the necessity for which has been brought about by the increased use of the lines to Central and South America, will probably be completed by the first of December. The cable is being made in England for the Central & South American Telegraph Co., and its cost will be about $1,500,000. The cable steamship *Colonia* on November 1 will leave England for New York. It will begin laying it off Coney Island, proceeding southward at the rate of seven knots an hour.

RUBBER IN BURMA.

A LATE report from Consul Maxwell K. Moorhead, stationed at Rangoon, India, contains some interesting information regarding the production of plantation rubber in Burma, of which the principal features are given below:

Hevea rubber was first introduced into Burma in 1877, when a small consignment of plants was sent from Kew Gardens to Mergui. A second consignment was obtained from Ceylon in 1879. This was the beginning of the Government experimental garden, the results obtained from which proved conclusively that *Hevea* rubber could be grown in Burma. In 1910 the Government sold the experimental garden to the Mergui Crown Rubber Estates. There is on this estate a 50-acre block of 35-year-old rubber trees. Girths of 70 to 80 inches are common, the largest tree measuring 108 inches, and their average yield is 12 to 15 pounds per tree.

The chief planting centers are Mergui with King Island 18 miles distant, and Victoria Point lying 220 miles south of Mergui, distant two days by steamer and forming the frontier between Burma and Siam. Weekly steamers ply between Rangoon and Mergui, taking two days for the trip. Other important districts where rubber has been planted are in Amherst district, near Moulmein; at Twante, near Rangoon; at Hlawga, 15 miles from Rangoon; at Shwegyin, Toungoo district, and in the far north close to the Chinese border, at Myitkyina.

The climate of the rubber-producing areas of Burma may be divided into four seasons, viz., the dry season, December 1 to March 31, in which practically no rain falls; the rainy season, June 1 to September 30, during which 90 per cent. of the total precipitation of the year occurs, 62 to 147 inches; the preliminary rainy season, April 1 to May 31, when 9 to 24 inches fall; and the declining rainy reason, October 1 to November 30, 9 to 12 inches. In the year from April 1, 1912, to March 31, 1913, the rainfall varied in the several districts mentioned from 85.12 to 182.63 inches and from 113 to 143 days.

While the rainfall is not as evenly distributed throughout the year as in the Federated Malay States, there is no season of prolonged drought, the dry season consisting of only four months. There are also heavy dews throughout the dry months. The mean daily temperature on the rubber plantations for the year is 80 degrees F.

The present area planted in *Hevea* rubber is 29,404 acres, and the total production for 1913 is thought to have been 650,000 pounds, as against 510,000 pounds in 1912. The commissioner of settlements and land records estimates that the area planted under rubber up to the end of 1913 should be 34,544 acres, and that the future new plantings and total production will approximate: In 1914—3,666 acres, production, 1,000,000 pounds; 1915—5,278 acres, production, 1,500,000 pounds; 1916—6,660 acres, production, 1,800,000 pounds; 1917—11,047 acres, production, 3,000,000 pounds.

The exports of raw rubber, including wild rubber, from Burma during the fiscal years ending March 31, 1913 and 1914, were 526,176 pounds and 765,408 pounds, respectively.

The authorized capital of the rubber companies in Burma is $4,063,690, of which $2,804,070 has been issued.

The laborers on the rubber estates are mainly Indian coolies, although Burmese are employed on some plantations. The average daily rate of pay is 16 cents for weeders, 18 cents for tappers, whose task consists of 250 trees, tapped on the third system, varying from one cut to three cuts per tree, according to size.

Most of the rubber produced in Burma is converted on the estate into smoked sheet and pale crêpe of various qualities. Recently Burma pale crêpe brought the top price on the London market.